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TEACHER'S EDITION
HOLT MATHEMATICS SYSTEM
BOOK 2

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Teacher's Edition
Holt Mathematics System
Book Two

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TEACHER'S EDITION CONTENTS

Contents for Pupil Text		iv
Scope and Sequence		v.
Teacher's Commentary		xiv
Activity Reservoir		xviii
Problems of the Week		xxii
Cumulative Test		xxvi
Chapter 1	Overview and Commentary	1a-10
Chapter 2	Overview and Commentary	11a-24
Chapter 3	Overview and Commentary	25a-46
Chapter 4	Overview and Commentary	47a-68
Chapter 5	Overview and Commentary	69a-92
Chapter 6	Overview and Commentary	93a-112
Chapter 7	Overview and Commentary	113a-136
Chapter 8	Overview and Commentary	137a-160
Chapter 9	Overview and Commentary	161a-180
Chapter 10	Overview and Commentary	181a-210
Chapter 11	Overview and Commentary	211a-228
Chapter 12	Overview and Commentary	229a-247
Basic Skills Check Up		248
Practice Exercises		251
Index		254

CONTENTS

1 **COUNTING THROUGH 20** 1
Number • The Number Zero • Writing Zero through Nine • Order of Numbers • Counting to Twenty

2 **COMPARING NUMBERS THROUGH 20** 11
Comparing Numbers Less Than Twenty: Introducing > and < • Ordinal Numbers through Ninth • Picture Graphs • Bar Graphs

3 **ADDITION AND SUBTRACTION FACTS THROUGH SUM 7** 25
Vertical Form Addition • Zero in Addition • Order of Addends • Vertical Form in Subtraction • Zero in Subtraction • Problem Solving • Basic Skills Check Up

4 **COUNTING THROUGH 100 • TIME** 47
Tens and Ones • Order of Numbers • Place Value • Writing Numerals • Comparing Numbers • Counting by Tens, Fives, Twos • Bar Graphs • Problem Solving • Time

5 **ADDITION AND SUBTRACTION FACTS THROUGH SUM 9 • FRACTIONS** 69
Sums 8 and 9 • Subtracting from 8 and 9 • Number Families for Sums 8 and 9 • Calendar • Mini-Problems • Comparing Numbers • One Half • One Third • One Fourth

6 **ADDITION AND SUBTRACTION OF TWO-DIGIT NUMBERS, NO REGROUPING** 93
Adding Two-Digit Numbers, No Regrouping • Subtracting Two-Digit Numbers, No Regrouping • Sum 10 • Subtracting from 10 • Addition Table • Word Problems

7 **COUNTING THROUGH 999 • MONEY** 113
Reading Hundreds, Tens, and Ones • Writing Three-Digit Numerals • Order of Numbers • Comparing Numbers • Counting by Fives, Tens • Counting Money: Penny, Nickel, Dime, Quarter, Dollar • Problem Solving • Three Addends

8 **ADDITION AND SUBTRACTION FACTS THROUGH SUM 14** 137
Sums 11, 12, 13, and 14 • Subtracting from 11, 12, 13, and 14 • Number Families from Sums 11-14 • Comparing Numbers • Checking Addition and Subtraction • Problem Solving • Basic Skills Check Up

9 **ADDITION AND SUBTRACTION OF THREE-DIGIT NUMBERS, NO REGROUPING** 161
Adding and Subtracting Hundreds, Tens, Ones, no regrouping • Sums 15, 16, 17, and 18 • Subtracting from 15, 16, 17, and 18 • Number Families for Sums 15-18 • Problem Solving • Addition Table

10 **GEOMETRY • MEASUREMENT** 181
Ordinal numbers through twentieth • Line segment • Triangle • Rectangle • Square • Circle • Inside, Outside, On • Faces, edges and corners of solid shapes • Tesselations • Similarity • Symmetry • Comparing lengths • Nonstandard units of length • Centimetre • Metre • Nonstandard units of capacity • Litre, half litre, quarter litre • Comparing capacity • Thermometer • Nonstandard units of mass • Kilogram, gram • Column addition of tens and ones, no regrouping.

11 **ADDITION AND SUBTRACTION OF TWO-DIGIT NUMBERS, REGROUPING** 211
Adding tens and ones with regrouping • Subtracting tens and ones with regrouping • Checking subtraction • Making change

12 **MULTIPLICATION FACTS THROUGH 5 x 5 (OPTIONAL)** 229
Readiness for multiplication • Factors and products • Order of factors • One and Zero as factors • Multiplication table to 5 x 5 • Tenths • Tenths as decimals • Parts of sets • Readiness for division • Simple division of sets to 20 using ÷

Basic Skills Check Up 248

Practice Exercises 251

Developmental Aspects of Lessons

The HOLT MATHEMATICS SYSTEM is "developmental" in that each lesson is sequenced to proceed from an initial activity, through a learning stage, and finally to practice exercises. This lesson style (**display**, **development**, and **drill**) was adopted to give children an understanding of the concepts in the lessons through active participation in the development of the concepts or skills, followed by practice in the use of these concepts.

Each lesson follows a definite pattern: (1) **display** — an *initial activity* where hands-on materials such as blocks are used to teach the concept; the initial activity appears in the side column of the *Teacher's Edition* for every lesson. (2) **development** — a *learning stage* which uses pictures and other visual hints to develop the concept; the learning stage is the first part of the Exercises where the child is guided, through the use of coloured numerals or other hints, to the pattern of response. To provide immediate reinforcement, the answer to some of the developmental items, indicated by circles, are placed in the back of the *Student's book*. (3) **drill** — *exercises* which drill the concept or skill presented in the display; the exercises are the items which the children do individually to demonstrate understanding.

Basic Skills

HMS embodies the philosophy that it is important for the student to develop a concept or skill meaningfully. However, a meaningful development needs to be followed by practice. To become a proficient user of mathematics one has to practise the skills that have been acquired. Accordingly, ample practice is provided to diagnose areas of difficulty and to maintain skills.

Throughout the program, a large number of computational exercises are presented with over 4000 in each book, Grades 2 to 6. Additional exercises may be found in the other HMS components.

Exercises which extend the developmental items presented in the lesson are starred. Additional challenges are provided by the **Brainticklers** which appear throughout the book.

HMS repeatedly asks students to discover patterns. These experiences are intended to help build a sense of relationship between numbers and to develop self-reliance when a problem is tackled. Discovering patterns is an enjoyable activity since it is usually accompanied by a sense of anticipation.

Diagnosing

Diagnostic materials appear throughout HMS in a variety of formats. The **Basic Skills Check Ups**, which are part of HMS from Readiness to Grade 6, provide experience in the type of format that is often used on standardized tests.

Cumulative Reviews in Grades 3 to 6 enable the teacher to pinpoint areas of the child's achievement or deficiency prior to studying other concepts in the text. Based on the results, one can determine what combination of learning experiences will best help each child.

All **Check Ups** and **Cumulative Reviews** are keyed in the *Teacher's Edition* to the pages on which the skills were presented.

The **Chapter Test** at the end of each chapter can also be used diagnostically. Each exercise in the test is referenced in the *Teacher's Edition* to a specific objective and page number. This provision enables the teacher to review specific concepts and skills needing improvement.

A **Cumulative Test Item Bank**, located at the front of each *Teacher's Edition* (Grades 1 to 6), covers a representative sampling of the entire year's objectives. There are two matching items per objective in the Grades 3 to 6 tests, thereby offering the opportunity for repeat testing. The **Cumulative Test** for Grades 1 and 2 is presented in a multiple-choice type format.

Maintaining Skills

Keeping acquired skills sharp is important to HMS. Maintenance pages therefore appear regularly throughout the pupil books. **Keeping Fit** (Grades 1 and 2) and **Tune Up** (Grades 3 to 6) are mixed frequently with stimulating **Practice** pages to help reinforce specific facts and concepts.

At the end of each book are collected additional **Extra Practice** exercises, keyed to the appropriate pages in the *Student's book*.

Additional and supplementary practice material in the form of duplicating masters, computational and problem solving skills kits, and calculator activity masters are also available and are keyed to the program.

Testing

A complete testing program for monitoring students' progress is provided within HMS. **Chapter Tests** (called "Think" in Grades 1 and 2) at the end of each chapter are designed to help evaluate the extent of mastery of the essential chapter content. In the *Teacher's Edition*, test items are referenced to pupil page numbers and specific objectives which are listed for each chapter. An invaluable measuring device, the **Chapter Tests** allow teachers to diagnose the particular strengths and weaknesses of each student.

Additional test materials and supplementary tests are available in the form of *duplicating masters* (Grades 3 to 6).

Measurement

The measurement section in HMS is completely SI metric. The strand features a "hands-on" approach to measurement augmented by written exercises which further broaden and reinforce the concepts.

Often a page of nonstandard, informal units of measure will help introduce the activities and exercises developing the established measurement system.

Problem Solving

Solving problems is one of the major strands in HMS. We start problem solving early and use it as a tool for reinforcing basic facts.

The development of problem-solving skills is very gradual. It is based essentially on (1) interpreting action pictures, (2) joining and separating sets of objects, and (3) solving word problems without pictures. Word problems are first presented in the form of mini-problems which contain a picture dictionary to help children read the printed words. Mini-problems contain only those words which are necessary for an understanding of the problems.

From these careful beginnings, problem solving in HMS is expanded to include:

- reading word problems
- choosing a number sentence to fit a word problem
- writing number sentences
- estimating the answer
- recognizing extraneous and insufficient information
- reading information from tables or graphs
- choosing the correct operation
- solving word problems related to careers
- multiple-step problems
- drawing pictures to help solve problems
- establishing and using a problem-solving technique

to mention a few.

The challenge of providing children with an opportunity to grow systematically in the ability to solve problems is met by incorporating word problems into many of the lessons throughout the program.

In addition to this rich and systematic program of developing problem-solving skills, HMS includes a lesson on problem solving related to a selected career in each chapter. This career strand is of considerable importance to this program and is therefore discussed in detail.

Career Strand

Making children aware of existing careers makes mathematics learning relevant, realistic, and motivational.

Specifically, the purpose of the HMS career strand is twofold:

- To stimulate career awareness in children by presenting them with problems which deal with situations related to various careers, and
- To provide teachers with the essential information about various careers.

Appropriate learning experiences or activities are provided in the *Teacher's Edition* for lessons dealing with careers. These lessons are adapted to the developmental level of the child.

The careers are chosen to focus on certain specific objectives:

- To help the child develop an awareness of physical skills
- To develop an awareness of self and others
- To help students develop self-reliance
- To develop an awareness of a multitude of careers
- To develop social awareness

Each chapter highlights one or more specific careers and provides the opportunity to discuss others.

Activity Pages

Interspersed throughout the texts are **activity** pages. **Activity** pages provide motivation and active participation on the part of the child. Concepts are developed or practised through the use of activities.

Chapter Themes

In an effort to motivate children and to interrelate mathematics to other subject areas, some chapters in these books are oriented toward certain themes. For example, the theme of a chapter may pertain exclusively to transportation, fairy tales, the sea, the farm, the community, the circus, foreign lands, and others. The illustrations in these chapters emphasize the theme of the chapter. These themes are identified in the **Chapter Overviews**.

THE TEACHER'S EDITION

The *Teacher's Edition* is the key to using HMS. All references to components of this program, as they apply to each lesson, are provided literally at one's fingertips. With this type of manual, the teacher can easily direct children to other practice materials, guide them to activities, and provide them with projects that will extend their mathematical horizons.

The layout for each individual lesson contains a reduced version of the pupil page with answers superimposed. Surrounding this are the related lesson commentaries closely positioned to allow quick and easy access.

Front of Teacher's Edition

A **Scope and Sequence** chart displays three years of topics and the extent to which they are presented in HMS. Using the chart, it is easy to tell, at a glance, where any particular lesson falls in the flow and scheme of the whole Mathematics System.

An **Activity Reservoir** section, consisting of mathematical games and activities, provides a framework for enjoyable practice work throughout the year. These games and activities are keyed into individual lessons, but each may be adapted and used at the discretion of the teacher.

A **Problem of the Week** section consists of challenging mathematical puzzles and problems. These are for additional motivation. They can be offered to children via the bulletin board or a special problem box.

A **Cumulative Test Item Bank** is supplied for the evaluation of the children's achievement with respect to part or all of the entire year's work. Pupil edition page references which are located along the margins of this section, allow the teacher to select items which test the appropriate desired objective. This format also allows the teacher to test on a regular basis or periodically spot check, as the particular situation may require.

Chapter Overview

Chapter Overviews are appropriately interleafed before each chapter. Each overview consists of the following parts:

An **Introduction** explains what content is to be studied in the chapter.

Objectives for the chapter are stated in behavioural terms.

Background provides a meaningful setting for the mathematical concepts and skills taught in the chapter.

Materials lists the materials that are suggested for use in teaching the lessons.

Career Awareness describes the career to be studied in that chapter and provides background information for discussion. When necessary a caption is given for the photograph illustrating the career (Grades 1 and 2).

Lesson Commentaries

Daily lesson commentaries generally provide varied approaches to teaching the lessons. Each lesson commentary, in the side columns of the *Teacher's Edition,* contains the following categories:

Objectives for each lesson are stated in behavioural terms. These objectives state very specifically what a child ought to be able to do at the end of the lesson.

Pacing suggestions are provided for some lessons to indicate how assignments may be differentiated.

Level A: a minimum course
Level B: an average course
Level C: an extended course

Vocabulary lists new words and terms introduced in the lesson.

Materials lists stationary supplies, props, demonstration aids helpful for teaching the lesson.

Related Aids keys the appropriate supplementary components of the program to the particular lesson.

Background provides a meaningful setting for mathematical concepts on which the lesson is based.

Suggestions usually provide readiness-type learning experiences which encourage children's involvement. This section contains the **Initial Activity** comments that may be completed before using the pupil page.

Using the Book provides specific teaching instructions for the lesson.

Activities provide varied learning experiences such as mathematical games, research projects, experiments, and so on that represent additional practice, enrichment, or extension. The activities are usually listed in order of difficulty.

Extra Practice supplies additional exercises which are appropriate to the content of the particular page. The assignment of these **Extra Practice** exercises, whether they be used orally as review preceding the next page, placed on cards or chalkboards as remedial exercises or perhaps for fast finishers, is of course left up to the discretion of the teacher.

SUPPLEMENTARY MATERIALS

Activity Masters (Grades 1 and 2) and *Duplicating Masters* (Grades 3 to 6) provide extra practice, enrichment, and extension for selected lessons, graph paper, dot paper, cutouts for activities, nets for geometry, and additional chapter tests (Grades 3 to 6).

BFA Computational Skills Kits I (Grades 1 to 3) and *II* (Grades 4 to 6) provide a diagnostic/prescriptive program for both instruction and practice. Simple placement tests help identify each child's level.

BFA Math Problem Solving I and *II* offer instruction and practice in solving math story problems. The kits are organized into five sections: Addition/Subtraction; Multiplication/Division; Application; Review; Enrichment.

Calculator Activity Masters provides an opportunity to use the calculator to explore topics formerly thought to be too difficult and tedious. The exercises are related directly to the concepts developed in the HMS *Student's book*. Emphasis is on generalizing concepts, using larger numbers, and extension of concepts.

ACTIVITY RESERVOIR

BASEBALL (FLASH CARD SPORTS)

Use: To practice operation skills

Materials: Index cards, chalkboard, or transparency

Players: Any even number divided into two teams

The Game: Almost any team sport can be adapted for classroom use. For example, children could play baseball. Problems can be written on index cards and sorted into four piles. Children could then decide whether they want to try for a single, double, triple, or homer. The "single" pile would consist of easy problems; the "double" pile, average problems; the "triple" pile, difficult problems, and the "homer" pile would consist of problems which represented an extension of what children had studied up to the present time. An incorrect answer would be considered an out; no balls or strikes. One point for each run.

If children prefer to follow basketball or if that is the particular season, you can adapt the game for use in the class. Divide the class into teams. Score two points for each correct answer. This will be similar to scoring a basket. If a child gives an incorrect answer, the opposite team gets a foul shot (worth one point if it is made) before their turn. Both teams take turns at answering questions.

You can adapt football for the class. One team starts the ball on the centre line and has three turns or downs to gain 10 m and make a first down. Again, you can group problems according to their degree of difficulty. Easy problems go into a pile marked "1 m gain." Average problems go into a pile marked "2 m gain." Difficult problems go into a pile marked "5 m gain." If you want to create new piles for throwing a long pass or a short pass or a screen or draw, you can. To punt on third down, the team must answer the questions correctly. All punts are 30 m long. A touchdown scores 7 points. There are no extra points or field goals.

For each of these games, children can choose to be one of the teams in baseball, basketball, or football, and they could go further by pretending to be one of the players on the team. Since many children will have different favorite players, you might want to have All-Star games so that many teams and players are represented.

You can add flavor and increase enthusiasm if you have a poster or two to hang in front of the room while you're playing—sort of an advertisement for your own wide world of sports.

Baseball and basketball are easily played on the chalkboard since drawing a baseball diamond or a basketball court is not difficult. However, you will probably want to make a transparency of a football field to approximate as much of game play as possible. In this case, you can use a small triangle cut out of construction paper to keep track of distance. Unlike either baseball or football, children will come up against situations which make it necessary to add and subtract two-digit numbers with regrouping and renaming to figure out distance. While this is the most complicated game of the three, it also is the most mathematically demanding.

BASIC FACT PRACTICE CARDS

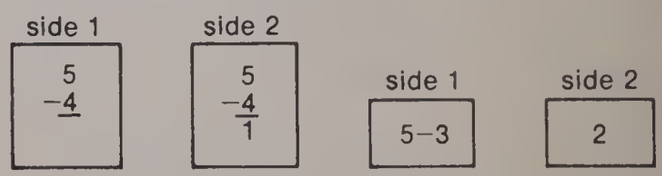
Use: To practice skills in basic addition, subtraction, and multiplication facts

Materials: Oaktag, felt tip marker, make cards for all the combinations through sum or product 18, numeral cards through 18

Players: One or more, or two teams

The Game: Separate the class into two teams. The teams take turns. A child on one team selects a numeral card such as 4. Children on the other team select addition, subtraction, or multiplication practice cards whose answers are four and stand by the child with the numeral 4. A point may be given for each correct response. (Children should soon learn that it is to the advantage of the team choosing the numeral card to choose a number carefully.)

In addition to the usual flash card elimination "bees," children may practice facts individually by looking at each addition, subtraction, or multiplication card, naming the answer, and then turning the card over to check.



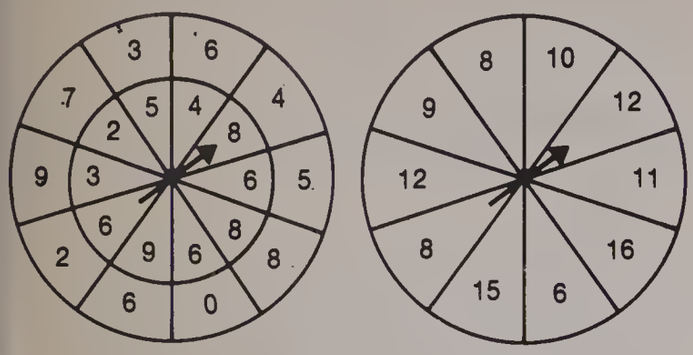
BASIC FACT WHEELS

Use: To practice basic addition and subtraction facts

Materials: Oaktag, compasses, scissors, brass fasteners

Players: One or two

The Game: The child spins the arrow to show two numbers. Then the child adds the numbers and gives the answer. The child receives one point for each correct answer. The answer to each basic fact will appear on the back of the wheel as shown below:



Front Back

To practice basic subtraction facts, prepare a wheel similar to the one above. The numbers in the outer circle should be larger than those in the inner circle. The child spins the arrow and subtracts the number in the inner circle from the number in the outer circle.

BATTLE

Use: To practice comparing numbers

Materials: Small numeral cards (about 5 cm × 8 cm), one numeral on each (0-99)

Players: Two, three, or four

The Game: The card game "Battle" can be played with two children. Shuffle the deck of cards. Each child gets half the deck. Both children hold their decks face down. Each child turns over one card at the same time. The child whose card has the higher numeral value wins both cards. (You might display a number line in order to prevent disagreement over which of two numbers is greater.) If both children display a card with the same number, have each child turn over another card. These second cards determine the outcome of the tie. The winner is the child with the most cards (or all the cards) at the end of the game.

This card game can be used to practice comparing numbers and the concepts of less than and greater than.

BINGO

Use: To practice basic facts in addition, subtraction and multiplication; to practice recognizing equivalent names for given numbers; to practice recognition of various expanded numerals and geometric shapes

Materials: Counters (as construction paper disks), cards with descriptions of cells, game boards like the one pictured below (Game boards should reflect the child's level of accomplishment.)

3 + 1	5 − 2	seven	24
two 10's	15	8 + 9	18
16 − 4	nine	1 ten + 6	5 + 7
11 + 3	40	12	zero

Sample descriptive cards for the board above might include a wide variety of basic facts and even expanded numerals. For example, one cell might be "Apple, 4". In one cell, over the Apple, 3 + 1 (another name for 4) can be found; the child covers the cell, 3 + 1, with a counter. Not all children will have a cell which matches the call. Later, the game may be extended to 25 cells using the letters BINGO instead of pictures of fruit.

Players: Any number

The Game: Each player has a game board. Cut some index cards in half and use them to write descriptive clues on. Mix the clues by shuffling the cards. Choose a card and read it to the group playing. Keep the cards called separate for checking.

As in regular Bingo, the first child to completely cover a horizontal, vertical, or diagonal straight line wins.

BUTTON TOSS

Use: To practice addition involving two or more addends

Materials: Muffin tin, small numerals, tape, buttons

Players: Two or more

The Game: Prepare a muffin tin with twelve cells. Tape a numeral from 1 through 9 in each cell. Each child tosses two buttons into the muffin tin, and adds the two numbers for the score.

This game may also be used to practice addition with three addends.

CONCENTRATION

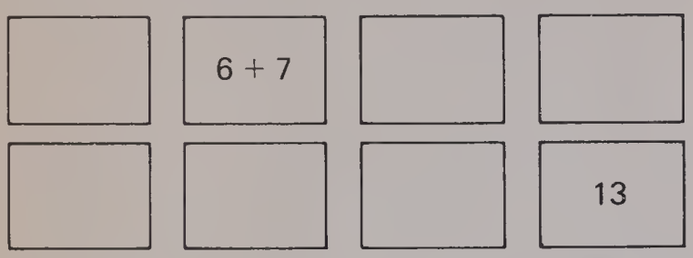
Use: To practice basic facts

Materials: Eight index cards

Players: Two

The Game: Information is written on one side of an index card. Each card has one other card that matches it. For instance, 6 + 7 and 13 are two cards that match. The cards are placed in an array with the information down. The first player turns over two cards. If the cards match, the child takes both cards. If the cards are not a match, they are turned back (information down) and the second child takes a turn. The players must concentrate to remember the information on the card previously turned over to help them in making a match. The child with the most cards in a pile wins. As the children become adept, the number of cards in the array can be increased.

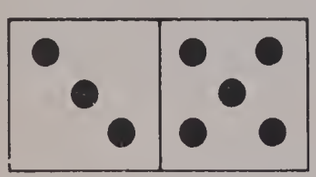
A concentration board with a matched pair might look like the one below.



DOMINO CARDS

Use: To practice skills in basic addition and subtraction facts through sum 18

Materials: Oaktag, red and blue felt tip markers or red and blue notary seals (available in any stationery store), make cards for all combinations through sum 18



Players: One or more, or two teams

The Game: Display a series of domino cards involving sum eight. Pair two children. Have them write an addition sentence that fits the card. Tell them that you will draw an X over the part of the set they are to think of removing. Then have the children take turns writing a subtraction sentence that fits the activity. Each correct response gives the child one point. After all the cards are discussed, the child with the most points wins.

An individual child can sort into piles all the cards which, for example, show combinations for sum six.

GUESS – TAKE OR GIVE

Use: To practice counting to 20; to practice subtraction through sum 20; to practice estimation

Materials: Two containers with 20 beans each

Players: Two

The Game: Each child begins with 20 beans. The children take turns. One child shows a set of beans, 20 or less. The second child guesses the number of beans, and then counts them. If the guess is correct, the second child takes the beans. If the guess is incorrect, the second child must give the difference between the guess and the actual number of beans displayed by the first child. For example, if the first child had shown 17 beans, and the second child had guessed 14 beans (or 20 beans), then the second child must give 3 beans to the first child.

The child with more beans at a predesignated time wins the game.

Variations: If the children have 100 beans each, they may show any number of beans less than 100. The second child then makes a guess for the number of beans. The children must subtract to find the difference. For example, if the number of beans is 42 and the guess was 68, then 68 - 42 is the difference.

NUMBER PUZZLES

Use: To practice basic addition and subtraction facts.

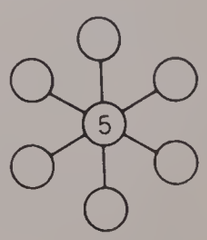
Materials: Duplicating masters, chalkboard or transparency

Players: One or more

The Game: Any of the following puzzles can be played in a small group with 2 or more players; with a puzzle for each team, relay races can be played. Individually, a child can work an entire puzzle either at his or her own speed or against a time set on a kitchen timer.

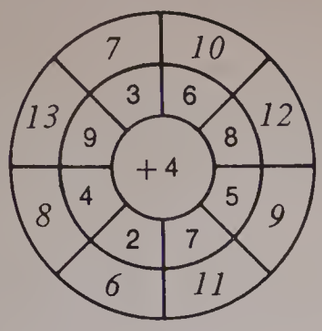
The puzzles listed below all deal with addition and/or subtraction. Each puzzle can be revised in order to be used for whatever fact family the child is learning at a particular time.

1. Draw this picture.



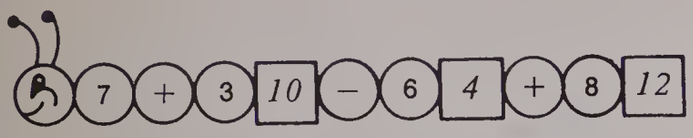
Tell the child to write 0, 1, 2, 3, 4, 5, in each ring so that the sum of the three numbers in any row is 10.

2. Draw this picture



Tell the children to put +4 in the inner circle. Put the numerals from 2 to 9 in the middle circle. Have the children write the sum of both numbers in the outer circle.

3. Make a caterpillar from circular and square sections. Write a numeral and + or - on each circular section, and leave the square sections blank. Have the child fill in the squares by making true sentences. For example:



4. Draw the following puzzle. Have the child find the answer for each row and for each column.

5	+	3	−	6	2
−		+		−	
3	+	6	+	3	12
+		−		+	
7	−	7	+	4	4
9		2		7	

(The answers should be given for the first row and the first column only.)

LADDER GAME

Use: To practice basic addition and subtraction facts through sum 18

Materials: Oaktag, duplicating masters, chalkboard or transparency

Players: Any number

The Game: Construct several "ladders." Put ten rungs on each ladder. The difficulty of the facts placed on the rungs should reflect the child's level of accomplishment. Challenge the children to see how high they can "climb" by giving the correct answer for each fact.

POP UP

Use: To practice order of numbers

Materials: Appropriate numeral cards such as 9 to 35 or 180 to 209

Players: 10 or more

The Game: Distribute the numeral cards, 9 through 35, for example, among the children. A child may hold one or more cards. The child with the 9 card stands up, shows the 9 card and says "Nine." Then the child with the ten card pops up, shows the 10 card and says "Ten." And so on until the last child pops up and says "Thirty-five."

The game may be adapted to practice giving the order of numbers through 100 or greater than 100. Counting by 2's, 5's, and 10's may also be used.

STOP THE MAGICIAN

Use: To practice skills for basic operations

Materials: Chalkboard or overhead projector, file cards on which exercises, such as 3 + 4, have been written

Players: 2 or 3 teams (2 or 3 players)

The Game: Start with a stick person.

Alternating teams and rotating among players, the teacher (magician) poses exercises to be solved. For each error, erase a part of the body (hand, foot, etc.) of the stick person. The object of the game is to stop the magician from making the stick person invisible. (Each team has its own picture.) Scoring: After all the exercises are completed, the team with the most complete stick person wins.

ZIP UP

Use: To practice basic facts in addition, subtraction, and multiplication; to recognize patterns in adding, subtracting, multiplying, and dividing

Materials: A watch with a sweep second hand

Players: Any number

The Game: Give the first player a starting number (5, for example), an operation to use (add 4 each time), and 15 s to go as far as he can. A sample response might go, "5, 9, 13, 17, 21, 25, 29, 33 ... (Oops! 15 s are up)." The child who can do the most computations is the winner.

PROBLEMS OF THE WEEK

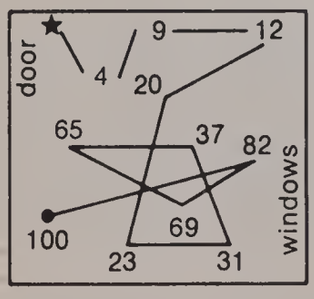
1. (The child will need some tagboard number cards and crayons.)
Draw a picture with a set of 4 in it. For example: four kites flying in a yard. Then cut your puzzle into 6 pieces, mix them, and put it back together.

2. Ask at least 10 people:
   a. what they want to be when they grow up
   b. their favorite TV show
   c. their favorite food

Record the answers. Make a bar graph.

3. (The child will need a calendar for the current month and an outside thermometer.)
Read the temperature each day at the same time and record it on the calendar. At the end of the month, report the highest and lowest temperatures and their dates to the class.

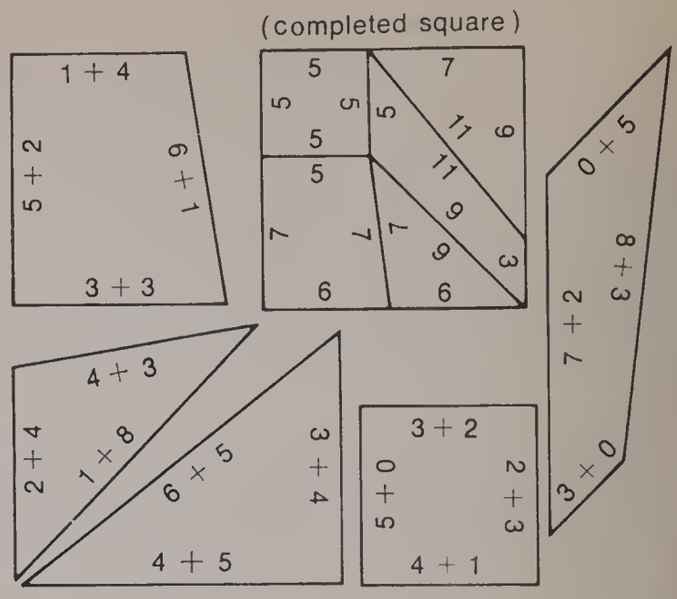
4. (Tape cards, with numerals or word names from 1 to 100 on them, to objects in the classroom. The child will need a map.)



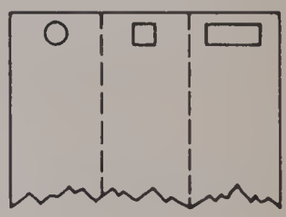
Circle each number on the map as you find it.
You must go in the order of the map.

5. (Send the child on a scavenger hunt for objects in the room. The child will need a ruler and list stating to find an object _____ cm long.)

6. Give the child the 5 tagboard puzzle pieces shown below. Tell the child to write the sum on each addition. Then match equal answers on the different pieces until a perfect square is put together (see completed square).



7. Make a chart. Insert the name of objects from your classroom under the appropriate shape on your chart. Labels could be placed on objects around the room so spelling would not be a problem.



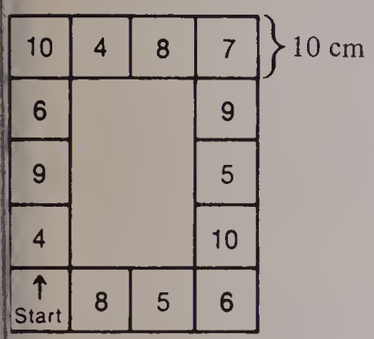
8. The child will need a piece of paper with 6 clock faces on it, a piece of paper with six 10 cm square sections, and a list of directions:
   a. Make the third clock say 4 o'clock.
   b. Make the first clock say 8:30.
   c. Make the fourth clock say 9:45.
   d. Make the second clock say 3:30.
   e. Make the sixth clock say 12 o'clock.
   f. Make the fifth clock say 2:15.

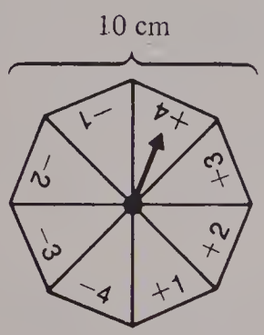
9. (Take 3 wooden cubes. Write a plus or minus on each side of one block. Write a number from 0 to 5 on each side of the other blocks.) Roll the blocks. Solve the problem. Alternate with a partner and record 1 point for each correct solution. The first person to score 10 points is the winner.

10. Find these hidden math words and circle them on your math word sheet: number, numerals, add, sum, cents, tens, subtract, sentence.

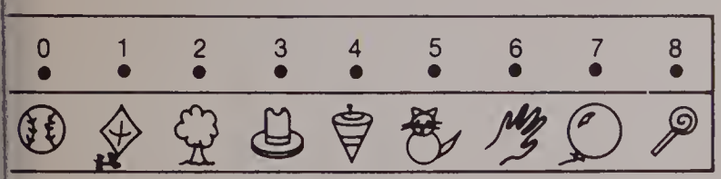
s	e	n	t	e	n	c	e
u	a	u	o	a	u	a	v
b	t	m	y	r	m	n	e
t	i	b	a	n	e	d	r
r	n	e	v	e	r	y	y
a	g	r	u	n	a	d	d
c	e	n	t	s	l	e	t
t	e	n	s	a	s	u	m

11. (The child will need a button or disc.)
Spin the dial for the operation you will use on the first number. If your answer is correct, advance your button to the next number and spin again. If incorrect, spin again and give your answer. You can alternate turns with a partner.





12. (The child will need the number line and a work chart. Have the child complete the "Steps" column.)



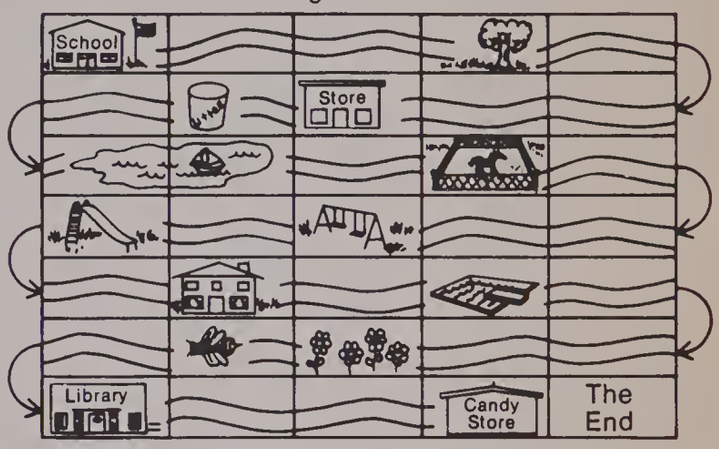
Start	Stop	Number of Steps
		3
		2

13. (The child will need a table of objects or pictures of objects on cards.)
Measure the objects on the table or the objects shown on the card to the nearest centimetre with a ruler. List the object and its size on a sheet of paper.

14. Take a square piece of colored paper. Fold it into 2 rectangles that match and cut them. Then fold the rectangles into 4 squares that match and cut them. Then fold the squares into 8 triangles that match and cut them. Mix up the pieces and put the puzzle back together.

15. Each block will take 2 or 5 min to jog.
(Each child will need the jogging map and a chart to complete.)

Jog With Me



Start	Jog	End up	Minutes
school	one block for each day in a week	*store*	2's 5's *14 35*
lake where boat is	to the house w/red shutters	blocks = *10*	*20 50*
swim pool	35 min (5's) or 14 min (2's)	*library*	
1 block past lake	3+2 blocks	*swings*	*10 25*
litter can	the number of windows in your room		
the old tree	the number of desks in your room		

16. (Each child will need a tagboard lotto card a or b and a sheet of answers (a or b) to cut up. A master answer sheet should be available.)
Put each correct answer on its problem *or* put each problem on its correct answer. Put answers in an envelope stapled to the lotto card when you are finished and you have checked it.

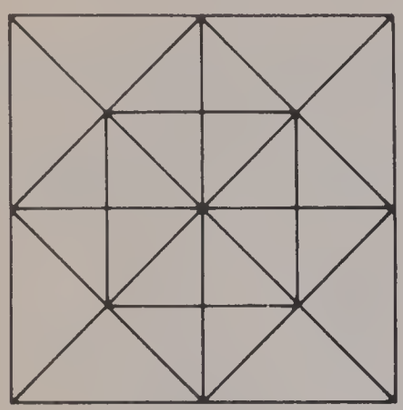
Card a

10	7	7	10	6	13
5	11	7	4	5	8
7	3	10	12	6	8
8	14	7	9	10	6

Card b

7 +3	14 −7	4 +3	6 +4	11 −5	7 +6
10 −5	6 +5	13 −6	12 −8	9 −4	8 −0
12 −5	8 −5	5 +5	6 +6	13 −7	4 +4
6 +2	7 +7	11 −4	5 +4	10 +0	10 −4

17. How many squares can you find? How many rectangles can you find?

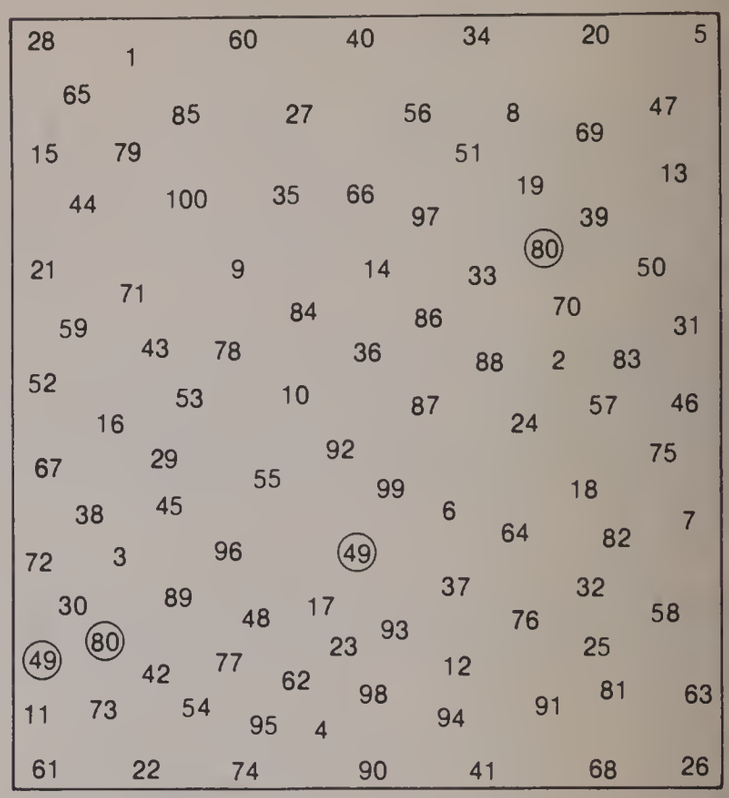


18. (The child will need objects of varying sizes with exact masses from 1 to 5 kg and a scale.) Lift one object, guess its mass. Your partner does the same. Find the mass of the object. See who was closer. The person closer to the actual mass scores 1 point. Alternate who guesses first.

19. (Duplicate this clock and add hands so you can show time to the hour, half hour and 5 min after.)
Hold the clock in front of a mirror and record what time you see.

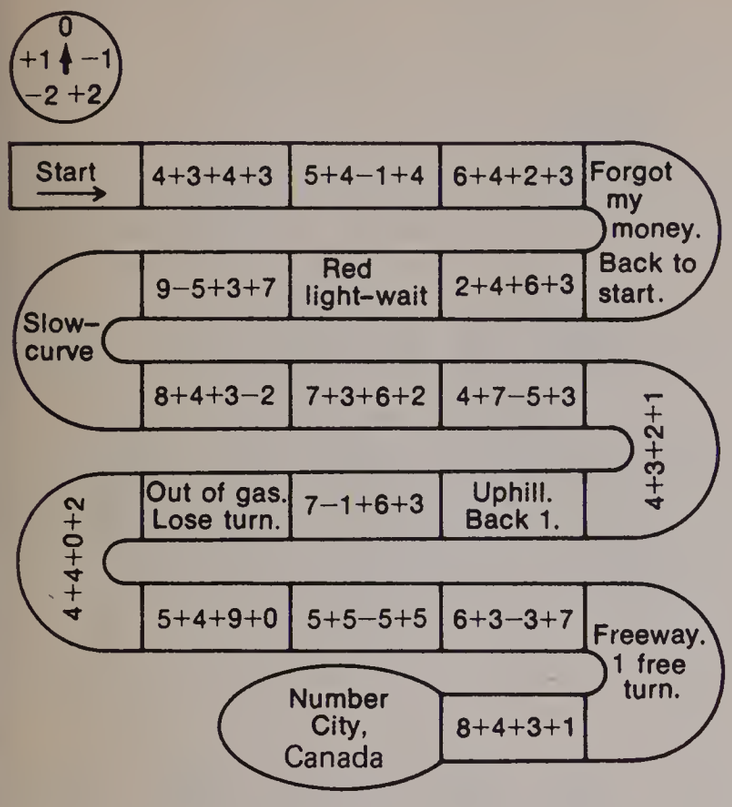
20. (The child will need many objects labeled with a price tag from 2¢ to 25¢. Magazine pictures of objects could be used.)
Put the objects that are similar into groups. Label your groups. How much do the objects in each group cost?

21. Two numerals have been written twice. Check each numeral starting with 1 and going to 100. Put a circle around the two trouble-shooter numerals that appear twice.

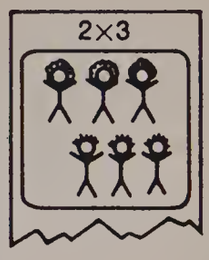


22. (The child will need three 25 cm by 25 cm cards with a picture of a scale on one, a picture of a cup on one, a picture of a ruler on another, and several magazines.) Cut out pictures of objects and place them on the card that shows what type of measuring instrument may be used to measure the object.

23. Place your button (imaginary car or hot wheels) on start. Spin the dial. +1, means advance one; −1, means go back one; 0, means stay.
Do what the number tells you to do. If you solve the problem correctly, spin the dial and continue. You may alternate turns with a partner.



24. (The child will need magazines and large pieces of paper with multiplication as the heading.)
Look through the magazine for a picture or pictures which could illustrate a multiplication sentence. (Hint: look for pictures with lots of similar objects in them.)
Paste your picture on the large paper. You can also find the picture first, then write your own multiplication sentence.



CUMULATIVE TEST

These test items cover a representative sampling of the objectives for Grade 2.

The items are written in a multiple-choice style in order to give the child an opportunity to experience the type of format that may be used on standardized tests.

Administering the Test

1. Give each section of the test at a separate time during the day or parts on different days.
2. Gather all materials necessary for the test beforehand. Decide whether crayons or pencils should be used.
3. Read through each section at least once before administering.
4. You may write the sample test items on the chalkboard and do these with the children before beginning the test.
5. Read each question to the child. The child is to read the possible answers and mark a response as directed. Give any explanation you feel is warranted so that the child fully understands the question. Answer questions raised but do not give help.
6. Move around to see if pupils are following directions. Do not let pupils move ahead to the next item until you give instructions to do so. Then announce the next number and read the question. Give sufficient time to respond, but pace the testing at a reasonable speed.

Answers To Test

Section I **1.** fourth apple **2.** 9 **3.** 15 **4.** 77 **5.** 600 **6.** 28 **7.** 55 **8.** 20 **9.** 89 **10.** 9 **11.** 500 **12.** 750 **13.** 198 **14.** 858 **15.** 30 **16.** 400 **17.** 134 **18.** 37 **19.** 416 **20.** 605

Section II (columns left to right)

Addition

1st column: 11; 16; 59; 458; 47
2nd column: 13; 12; 75; 487; 16
3rd column: 16; 68; 90; 14; 98

Subtraction

1st column: 5; 9; 82; 36; 5
2nd column: 6; 6; 28; 841; 8
3rd column: 3; 9; 67; 322; 72

Section III **1.** 7 **2.** + **3.** 89 **4.** 69 **5.** 16¢ **6.** 10¢ **7.** 41 **8.** 208 **9.** 3rd figure **10.** 4th figure **11.** 2nd figure **12.** Answers may vary. **13.** 4:30 **14.** 10:05 **15.** 9 units **16.** 50¢ **17.** 1/4 **18.** 1/3 **19.** 1 dime, 1 nickel, 1 penny **20.** Answers may vary. **21.** 7 **22.** 28 degrees.

Sample Item

1. How many balls are in this set?

3 4 5 6

2. Which number is missing?

4 5 6 ____ 8

3 7 1 9

Instructions

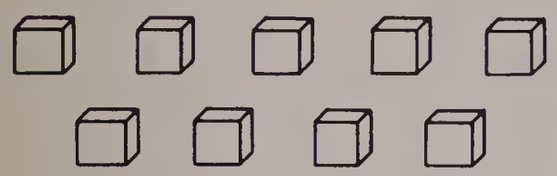
Panel 1: Say, "In the upper left-hand corner, find number 1. The question is: How many balls are in this set? Count the balls in this panel. How many are there? (5) Read the choices in dark print. Yes, there are 5 balls, so trace the ring around 5."

Panel 2: "Move to the right where it says number 2. Let's read the numbers: 4 5 6 ____ 8 (four, five, six, blank, eight) Which number is missing? Ring the dark number that shows the missing number. Which number did you ring? You should have a ring around 7."

ection I – Concepts

1. Which is the fourth apple?

2. How many blocks?



8 9 10 17

3. How many cookies?

8 15 17 20

4. Which number is missing?

76 ___ 78 79 80

67 74 77 81

5. Which number is missing?

596 597 598 599 ___

594 595 600 601

6. Which number is missing?

24 26 ___ 30 32

25 28 31 82

7. Which number is missing?

45 50 ___ 60 65

40 51 55 70

8. Which number is missing?

___ 30 40 50 60

20 25 29 52

9. Which is one greater than 88?

85 89 90 98

10. Which is one less than 10?

3 7 9 11

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11. Which is the largest number?

500 399 99 150

12. Which is the largest number?

739 700 750 710

13. Which is the smallest number?

260 198 330 421

14. Which is the smallest number?

858 860 878 880

15. Which is thirty?

13 30 31 33

16. Which is four hundred?

4 40 100 400

17. Which is one hundred thirty-four?

134 413 431 562

18. Which is 3 tens + 7?

37 73 307 370

19. Which is 4 hundreds + 1 ten + 6?

146 416 461 614

20. Which is 6 hundreds + 5?

65 506 605 650

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Section II – Computation

Add.

$\begin{array}{r} 4 \\ +\ 7 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +\ 8 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ +\ 8 \\ \hline \end{array}$
9 10 11 12	11 12 13 14	14 15 16
$\begin{array}{r} 7 \\ +\ 9 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +\ 7 \\ \hline \end{array}$	$\begin{array}{r} 63 \\ +\ 5 \\ \hline \end{array}$
14 15 16 17	11 12 13 14	67 68 69
$\begin{array}{r} 24 \\ +\ 35 \\ \hline \end{array}$	$\begin{array}{r} 47 \\ +\ 28 \\ \hline \end{array}$	$\begin{array}{r} 53 \\ +\ 37 \\ \hline \end{array}$
59 95 609	74 75 615	90 108 8
$\begin{array}{r} 406 \\ +\ 52 \\ \hline \end{array}$	$\begin{array}{r} 367 \\ +\ 120 \\ \hline \end{array}$	$7 + 7 = ____$
98 458 854	487 488 784	13 14 15 10
$42 + 5 = ____$	$\begin{array}{r} 3 \\ 6 \\ +\ 7 \\ \hline \end{array}$	$\begin{array}{r} 21 \\ 42 \\ +\ 35 \\ \hline \end{array}$
45 47 48 92	15 16 17 67	88 89 97 98

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Subtract.

8 − 3	12 − 6	10 − 7
5 6 7	5 6 7 8	2 3 4 5
14 − 5	13 − 7	18 − 9
5 7 8 9	4 5 6 8	7 8 9 10
89 − 7	68 − 40	72 − 5
19 28 82 91	20 27 28 82	22 67 73 77
64 − 28	875 − 34	629 − 307
35 36 44 46	138 831 841	203 223 322
9 − 4 = ____	13 − 5 = ____	78 − 6 = ____
3 4 5 6	6 7 8 9	18 27 72 81

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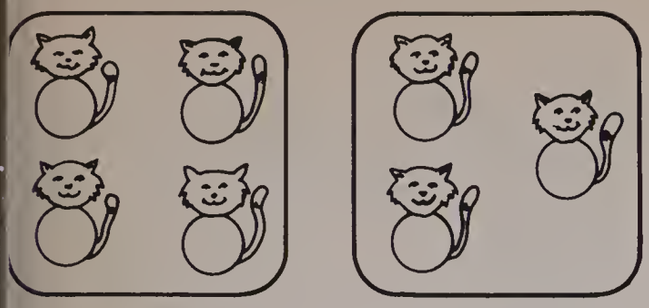
Section III – Applications



4 ○ 3 = ____

1. How many in all?

3 4 7 10

2. Do you add or subtract?

\+ − = ×

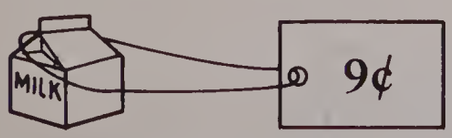
3. 57 red marbles.
32 green marbles.
How many in all?

25 52 88 89

4. Marie made 46 paper hats.
Pete made 23 paper hats.
How many paper hats did they make in all?

23 68 69 96

5. Cathy bought



How many cents did she spend in all?

10¢ 16¢ 17¢ 79¢

6. Danny had

25¢

He bought

15¢

How many cents left?

5¢ 10¢ 12¢ 40¢

7. 65 girls.
24 boys.
How many more girls?

14 41 89 98

8. There are 468 children.
260 are girls. How many are boys?

208 268 728

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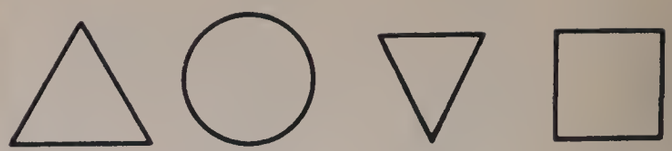
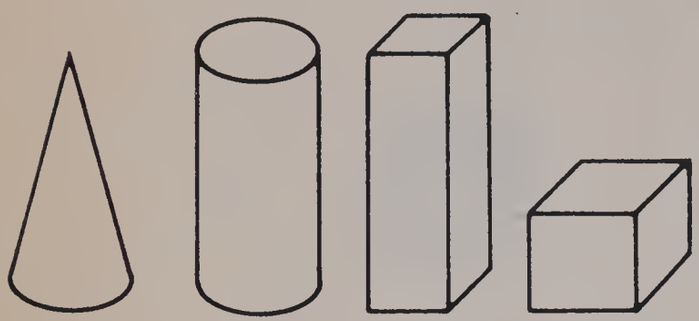
9. Which is a triangle?

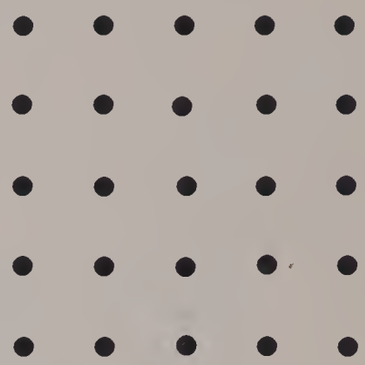
10. Which is a square?



11. Which is a cylinder?



12. Draw a rectangle.



What time is shown?

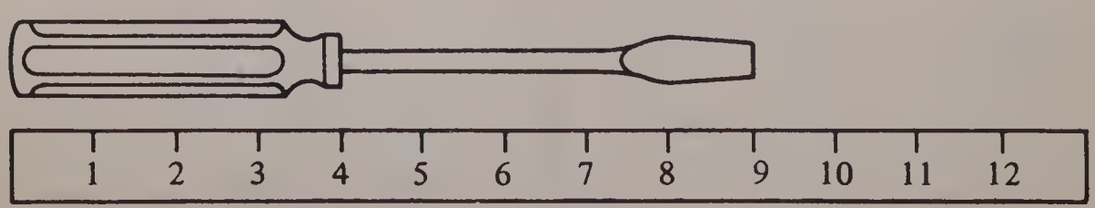
13.

5:20 4:30 3:25

14.

10:15 10:00 10:05

15. What is the length?



3 units 6 units 9 units 12 units

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16. How many cents?

25¢ **46¢** **50¢** **55¢**

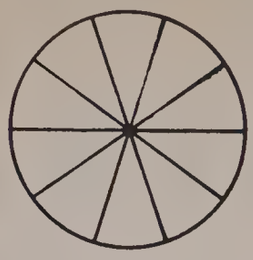
17. What part is shaded?

$\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$

18. What part is shaded?

$\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$

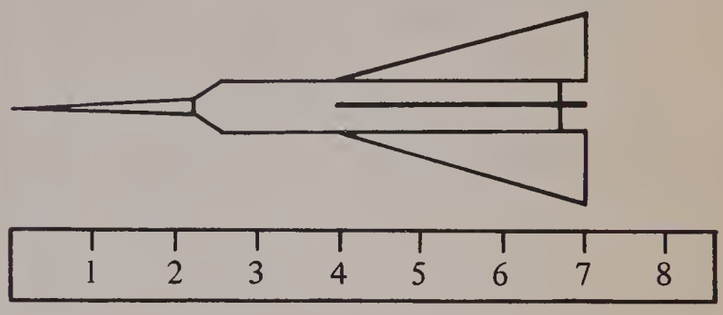
20. Color to show



0.1

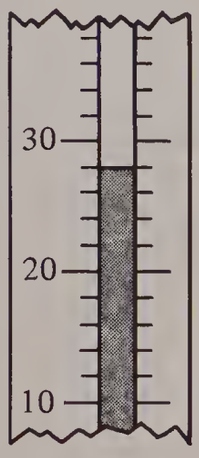
0.6

21. How many centimetres long?



5 6 7 8

22. What is the temperature?



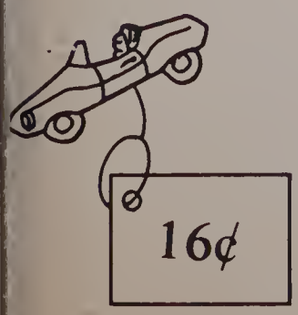
19 degrees

24 degrees

28 degrees

32 degrees

19. Which coins will buy the toy?



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CHAPTER 1 OVERVIEW

The numbers 0 through 20 are presented in this chapter. The child counts through 20, identifies the number of members in sets with 20 or less members, and writes the numerals 0 through 20. The art theme for this chapter is "Dime Store Objects."

OBJECTIVES

A To count through 20
B To write the numerals 0 through 20
C To know the number that comes just after or just before a given number with answers 20 or less
D To find the number of members in sets with 20 or less members

VOCABULARY

number 1
numeral 1
match 1
as many as 1
set 1
zero 2
count 3
zero through nine 3, 4
number line 5
just after 5
just before 5
ten through twenty 6

BACKGROUND

1. A number is a concept, an idea. Number is a property of sets. When we write a symbol to represent a number, we call it a numeral. Neither you nor the child should be too concerned about the terminology number and numeral. Most of the study in elementary mathematics is about numbers. Use the terminology that makes the flow of words easier and at the same time gets an idea across.

2. Matching the members of two sets is a process by which we decide whether or not two sets are equivalent. This process consists of choosing one member of one set and matching it with any member of the second set. Then we choose another member of the first set and match it with a member of the second set. This process continues until all the members of one set are used up. Both sets are assumed to be finite. If all the members of the first set are used up first and at least one member of the second set is left unmatched, then the second set has more members than the first set. If all the members of the second set are used up first and at least one member of the first set is left unmatched, then the first set has more members than the second set. If all the members of both sets are used up at the same time and no members are left unmatched, then the two sets have the same number of members. In this case, the two sets are *matching sets.*

MATERIALS

peg board and colored pegs
numeral cards 0 through 20
clear plastic box
small objects (at least 20)
number word cards for zero through nine
number line 0 through 9
20 beans

It might be helpful to establish a well-planned worktable for materials. The materials on the worktable should be collected by the children as well as you. You may begin with a partitioned tray or box containing a variety of small objects for counting and showing sets. You might include the following materials in the first box: buttons, disks, blocks, beans, small wooden cubes, and bottle caps. Another box might contain the following: straws, tongue depressors, popsicle sticks, pipe cleaners, or other things that are easily bundled. As the children cut out pictures of sets they can be placed in a file. You may also wish to prepare materials like numeral cards.

CAREER AWARENESS

Salesworkers [9]

The duties, responsibilities, and skills of salesworkers vary with the kinds of merchandise they sell. The salesperson should be able to tell something about the construction of an article, demonstrate its use, and show various models and colors. In some stores special knowledge and skills may be needed to sell the merchandise. For example, in a pet shop, a salesworker should know about the care and feeding of the animals.

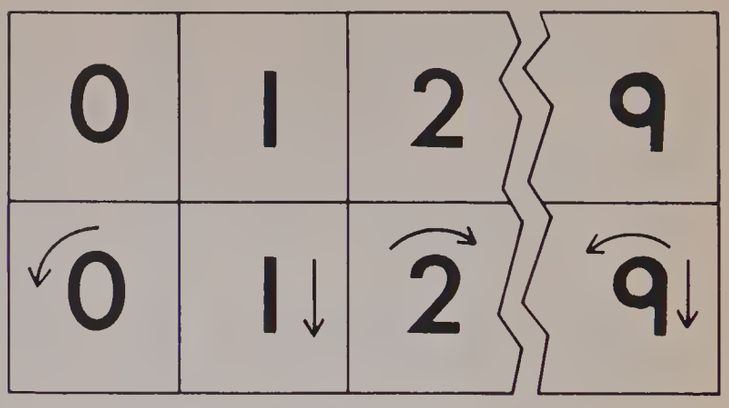
Salesworkers have to make out sales or charge slips, receive cash payments, and give change and receipts. They are in constant contact with people.

It is important that children develop an awareness of self and others. Children should realize that salesworkers must be able to get along with people. Their attitude often determines whether or not a customer will return. This can affect a rise or fall in sales.

Photo description: The salesworker in this toy store has taken payment and is giving change to the customer. She will then wrap up the purchased stuffed frog.

BULLETIN BOARD

1. Select a group of children to make a chart showing how to write the numerals 0 through 9.



2. Select a group of children to make a numeral-word-set chart for 0 through 9.

numeral	word	set
0	zero	
1	one	
2	two	
3	three	

3. Select a group of children to make a numeral-word-set chart for 0 through 20.

OBJECTIVES

To identify sets with the same number of members
To find the number of members in sets with 1 through 5 members
To read the numerals 1 through 5

PACING

Level A	All (1-2 guided)
Level B	All (1-2 guided)
Level C	All (1 guided)

VOCABULARY

number, numeral, as many as, match, set

MATERIALS

numeral cards for 1-5

BACKGROUND

A set is a group or collection of things. Each thing in a set is a member of the set.

See Items 1 and 2 in the Background of the Chapter Overview.

SUGGESTIONS

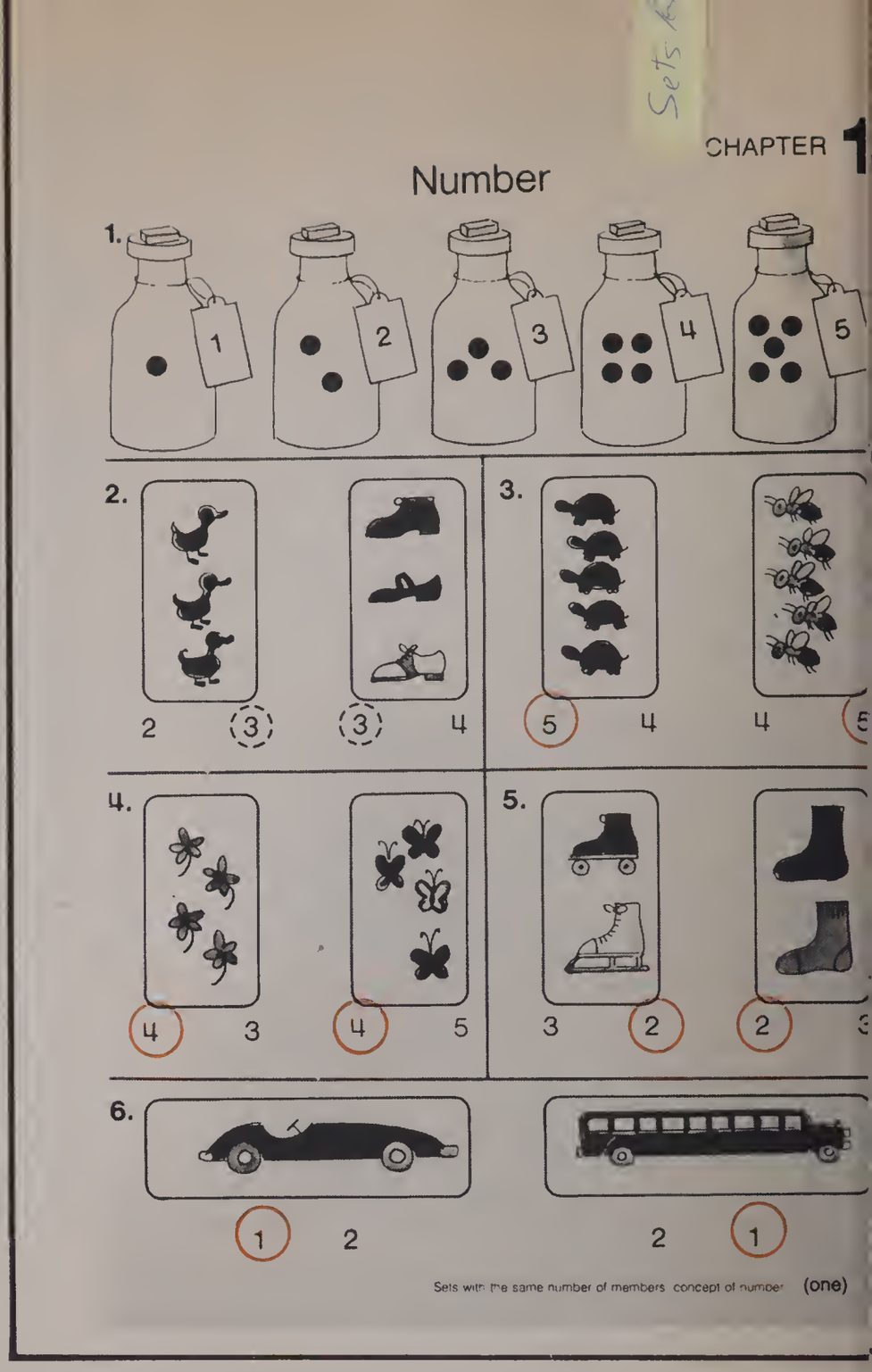
Initial Activity Show a set of 3 books. Ask the child to show as many pencils. Discuss the idea that the two sets have the same number of members. Ask, "How many members in each set? (3)"

ACTIVITIES

1. Have children work with set and numeral cards 1-5 and associate each number with a set.

2. Provide 5 objects. Have the child show a set of 1, then 2 (up to 5). Then provide 5 crayons and have the child show two sets with the same number of members.

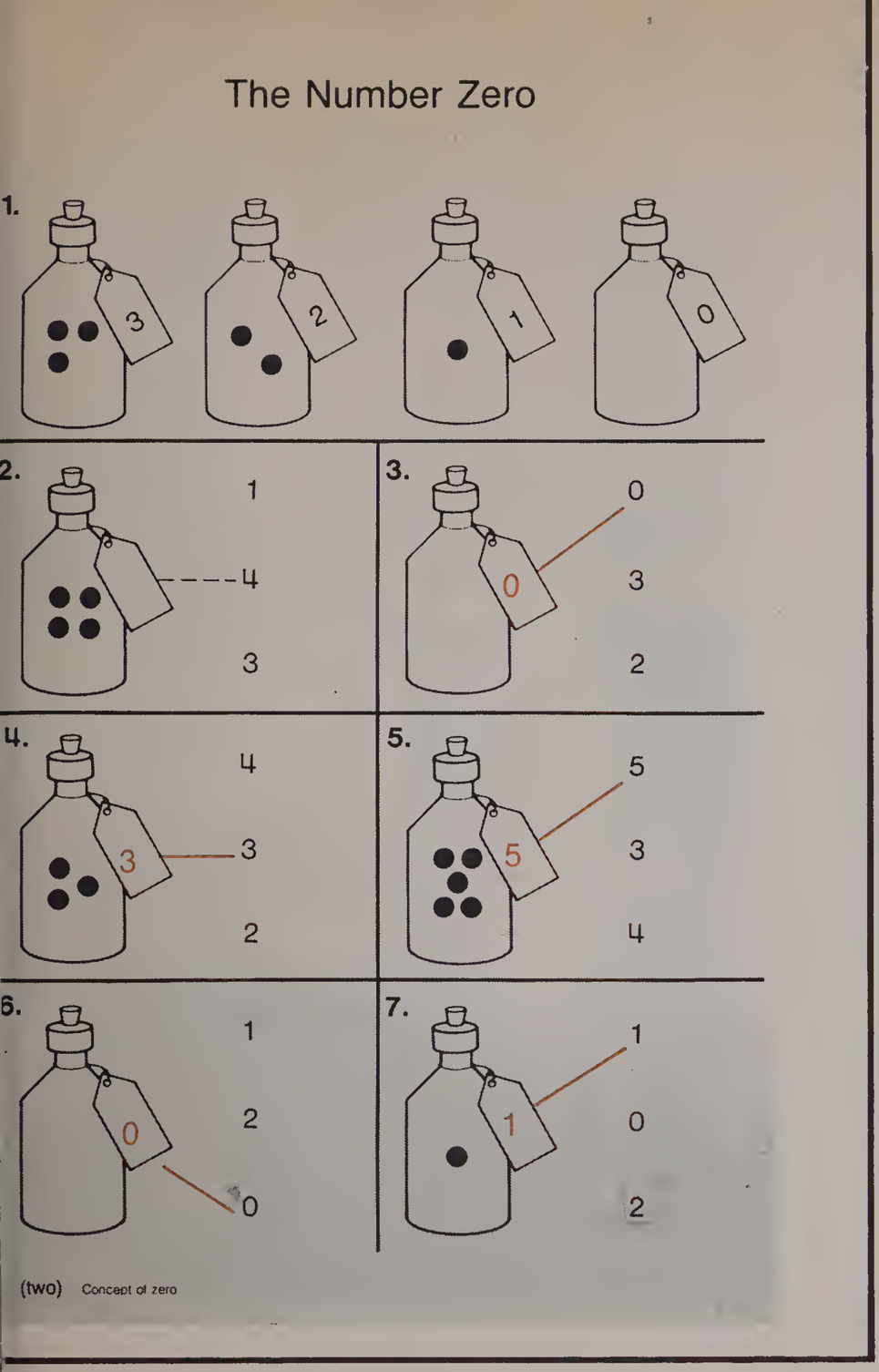
3. Provide set cards having 5-10 members. For each card, challenge the child to draw or construct sets with the same number of members.



Using the Book Panel 1: Ask, "How many marbles are in the first bottle?" Have the child ring the 1 on the tag. Ask, "How many marbles are in the second bottle?" Ring the 2 on the tag. Ask, "Two marbles is how many more than one marble? (1)" Continue in this manner for the remainder of the panel.

Panel 2: Have the child match the members of the two sets. Ask, "Are there as many ducks as there are shoes? (yes)" "How many ducks? (3)" Have the child trace over the ring around the 3 below this set. Ask, "How many shoes? (3)" Have the child trace this ringed 3. Ask, "Is the number of ducks the same as the number of shoes? (yes)"

Panels 3-6: For each panel, have the child match the members of the two sets to show the two sets have the same number of members. Then have the child find the number of each set and ring the numeral below each set.



Using the Book Panel 1: Ask the child to read the tags from left to right. Tell the child the dots show how many marbles are inside each bottle. Point to the first bottle. Ask, "How many marbles? (3)" Have the child point to the 3 on the tag. Continue in this manner for the second and third bottles. Then ask, "Which bottle is empty?" Have the child read and point to the 0. Explain that zero is the number for a set with no members.

Panel 2: Ask the child to count the marbles in the bottle. Ask, "What number should be shown on the tag? (4)" Have the child find the 4 in the panel and trace over the dashed line from 4 to the tag.

Panels 3-7: Tell the child to find the number of marbles in each bottle, then find the numeral and draw a line from the numeral to the tag on the bottle.

OBJECTIVES

To associate the number zero to a set without members

To find the number of members in sets with 5 or less members

PACING

Level A	All (1-2 guided)
Level B	All (1-2 guided)
Level C	All (1 guided)

VOCABULARY

zero

MATERIALS

clear plastic box, five small objects, numeral cards for 0-5

SUGGESTIONS

Initial Activity Develop an understanding of the number 0. Show a clear plastic box with 5 objects. Ask the child to describe the things in the box and give the number of things. Remove 1 object at a time and each time ask the child to give the number of the set, and show the numeral card. Conclude with the empty box and the number 0.

ACTIVITIES

1. Have the child begin a "Number Book" for this chapter. Provide 6 sheets folded and stapled in the middle. The child's name goes on the top page. Write a numeral from 0-20 on each page. Have the child draw dots or paste paper shapes to correspond with each number 0-5. Complete numbers 6-20 later.

2. Have the child match the numeral cards 0 through 5 with the set cards having 0 through 5 members.

3. Have the child think of some uncommon sets in the classroom that have 0 members. For example, the number of horses in the room is zero.

OBJECTIVES

To identify sets with 0 through 9 members
To count through 9
To write the numerals 0 through 9

PACING

Level A	3 All
	4 All
Level B	3 All
	4 All
Level C	3 All
	4 All

VOCABULARY

zero through nine, count

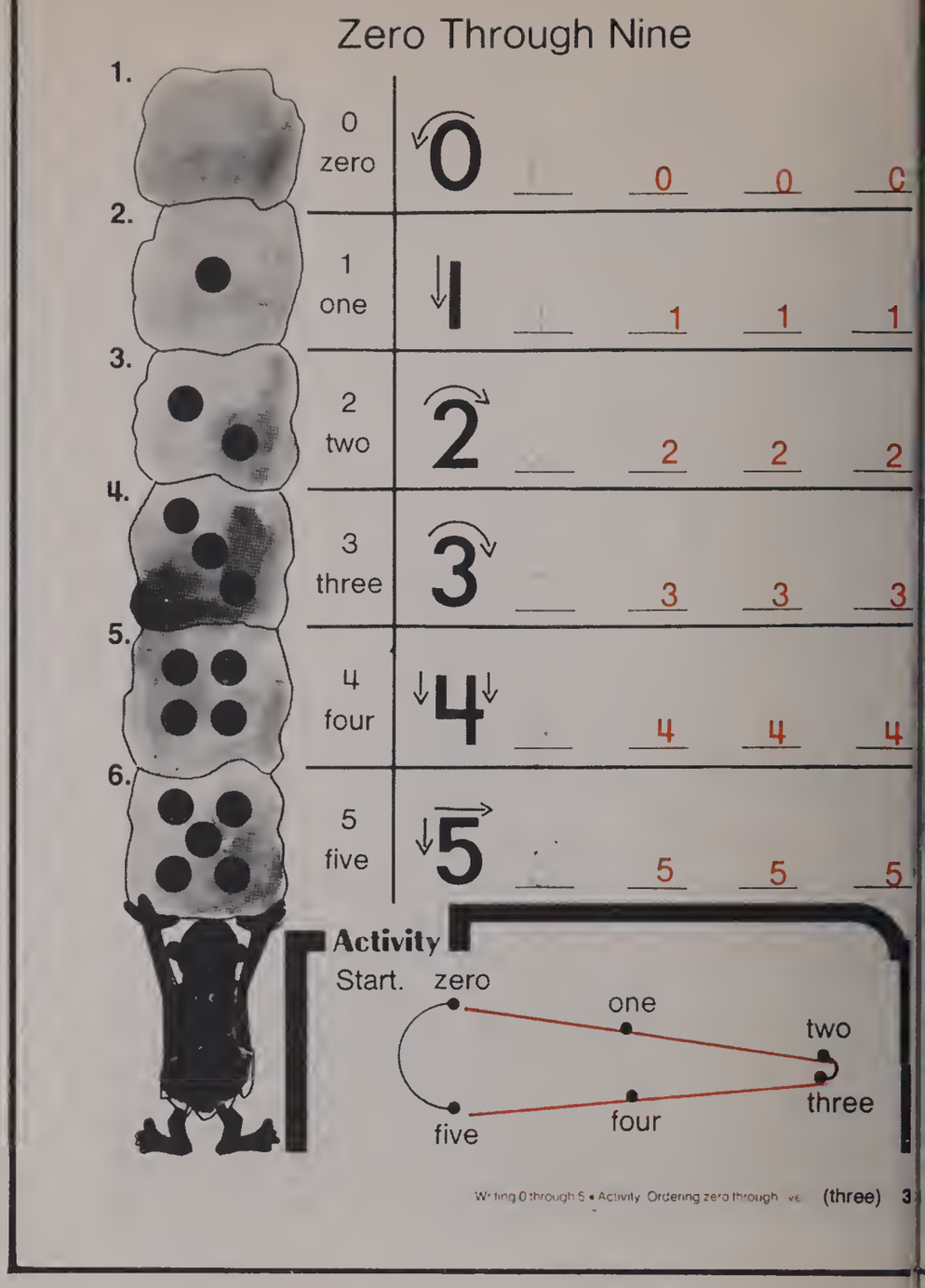
MATERIALS

numeral cards for 0 through 9, number word cards for zero through nine

SUGGESTIONS

Initial Activities 1. Place 9 chairs in a row. Ask the child to count them. Have the child count them again and this time place the numeral cards for 1 through 9 on the chairs as they are counted. The child then matches the number word cards for one through nine with the numerals. You may discuss the idea that, when counting the chairs, each number tells how many chairs have been counted.

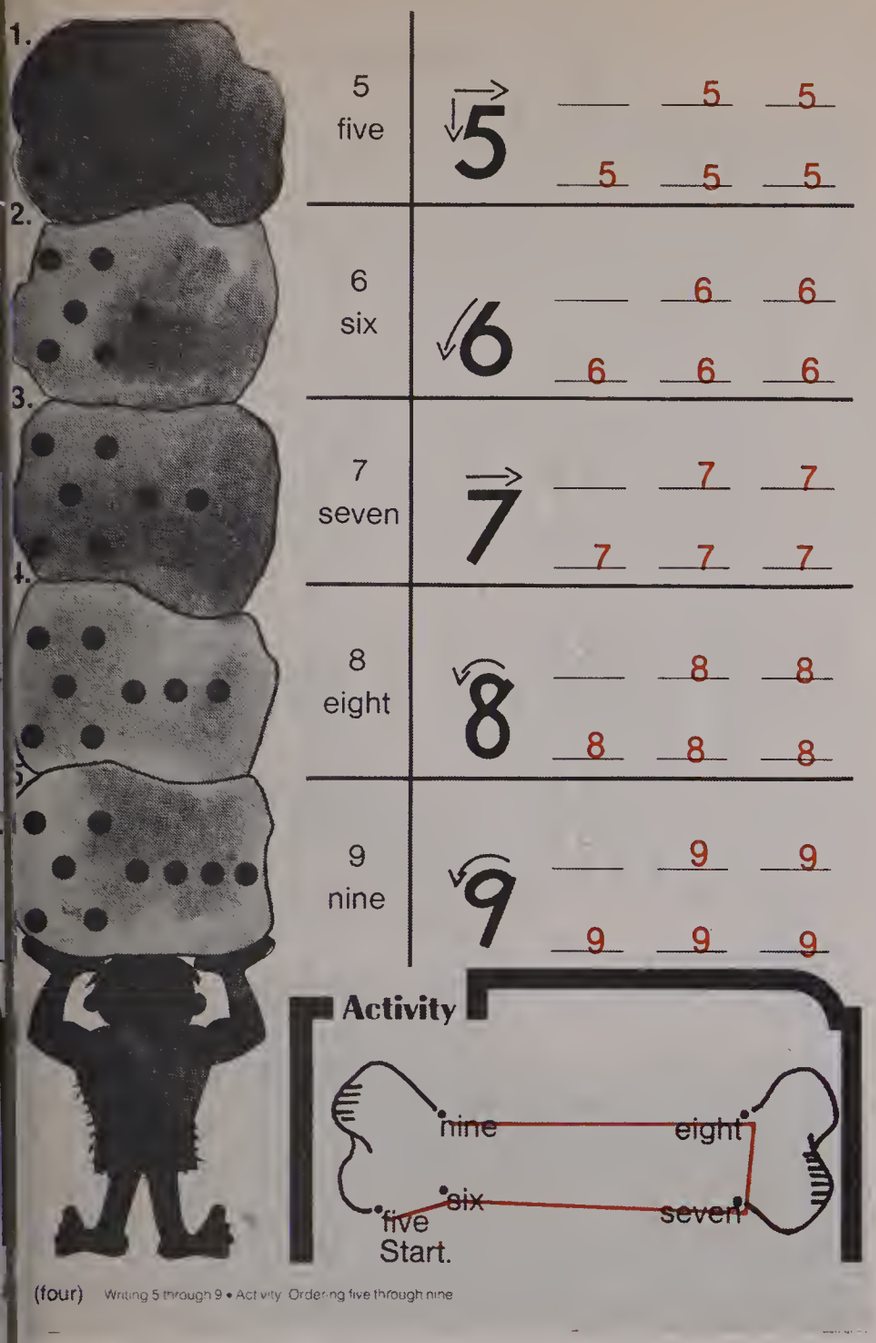
2. Demonstrate how to write the numerals 0-9. An overhead presentation with numerals to trace over is suggested if possible.



Using the Book Panel 1: Ask, "How many dots are on the rock? (none)" Explain that 0 and the word zero tell the number of dots on the rock. Have the child trace the 0; then have the child practice writing 0.

Panels 2-6: For each panel have the child count the dots, read the numeral and the word, then practice writing the numerals. Remind the child to follow the arrows when writing the numerals.

Activity: Have the child connect the dots in order. Start at zero. The result should be the caveman's club.



ing the Book Panel 1: Ask, "How many dots on the rock? (5)" Explain at the 5 and the word five tell the number of dots on the rock. Have the ild trace the 5. Then have the child practice writing 5 in the remaining five nks.

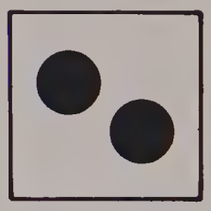
Panels 2-5: Have the child count the dots, read the numeral and the rd, then practice writing the numerals.

Activity: Have the child connect the dots in order. Start at five. The ult should be a big bone.

ACTIVITIES

1. Use a duplicating master. Make pictures of houses, each with a door but no windows. On each door, write a numeral 0 through 9. Tell the child to draw and color the number of windows on each house as indicated by the number on the door.

2. Give the child set cards with 5 through 9 members with numerals on the back. The child may count the dots and read the numeral on the back.



3. Involve the child in Bulletin Board suggestion 2 in the Chapter Overview.

EXTRA PRACTICE

1. Have the child count the boys, girls, all the children in the room, then the chairs.

2. Involve the child in Bulletin Board suggestion 1 in the Chapter Overview.

RELATED AIDS

ACT. MASTERS—1-3.

OBJECTIVES

To know the order of numbers 0 through 9

PACING

Level A	All (1 guided)
Level B	All (1 guided)
Level C	All (1 guided)

VOCABULARY

number line, just after, just before

MATERIALS

number line for 0 through 9

SUGGESTIONS

Initial Activity Show a large number line, 0 to 9. Discuss the ideas that 0 is the beginning mark and that each of the other numerals shows how far its mark is from the beginning mark. Ask the child to touch a numeral, such as 6. Then ask, "What number comes just after 6? (7) Just before 6? (5)"

ACTIVITIES

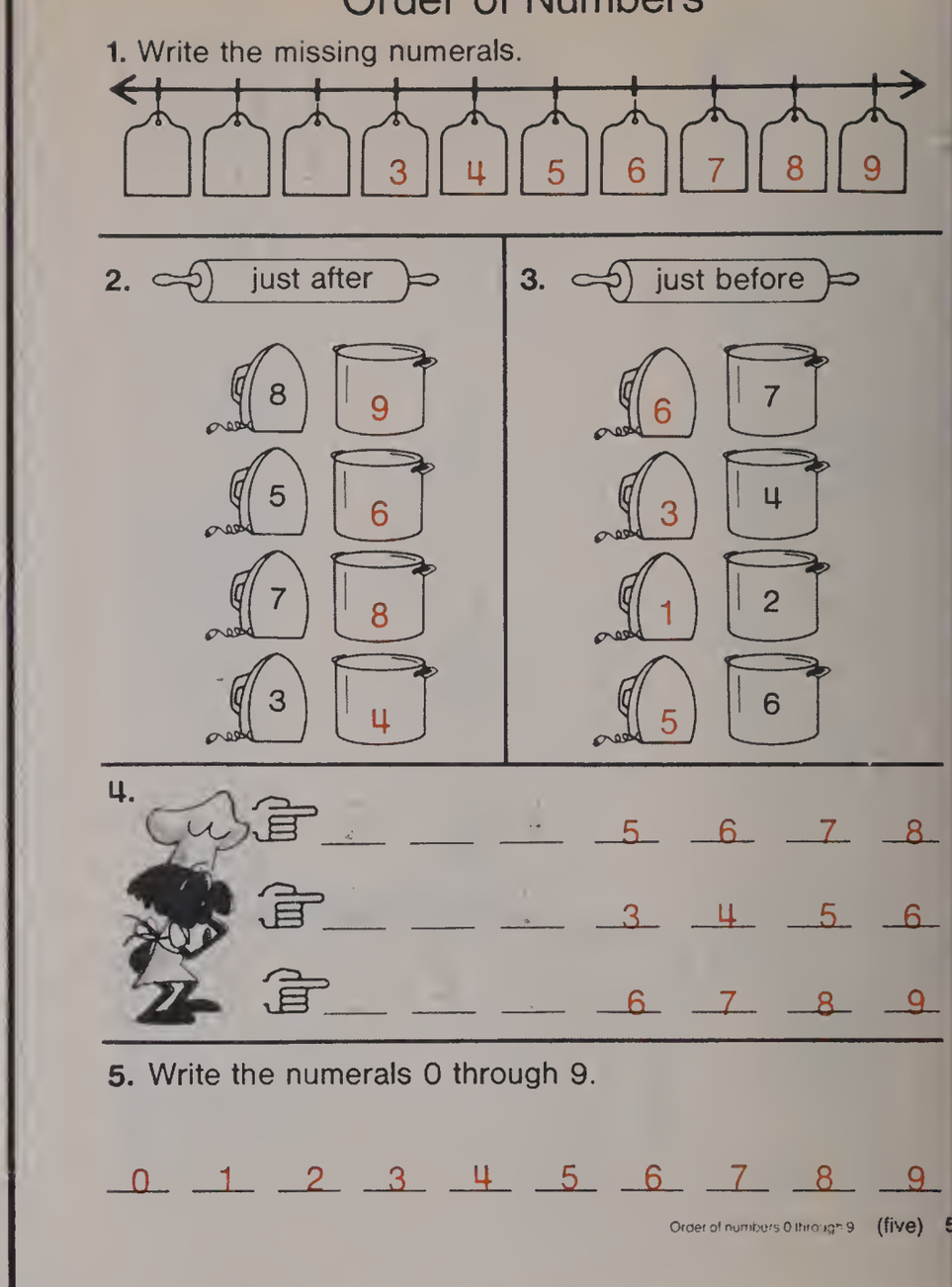
1. Have the child continue the "Number Book" suggested on page 2. Include pictures for numbers 6-9.

2. The child may manipulate objects such as plastic tumblers to reinforce understanding of the order of numbers 0-9. Put a numeral on each tumbler. Scramble the glasses. Have the child restore the order.

3. Give the child three "grab-bags," the *first* containing numerals 0-9; the *second* words zero through nine; and the *third* pictures of sets containing 0-9 members. Have the child pick up a numeral at random from the first "grab-bag." Then search through the second bag for the correct word, and the third bag for the correct picture. Repeat until all sets (0-9) have been found.

RELATED AIDS

ACT. MASTERS—1-3.



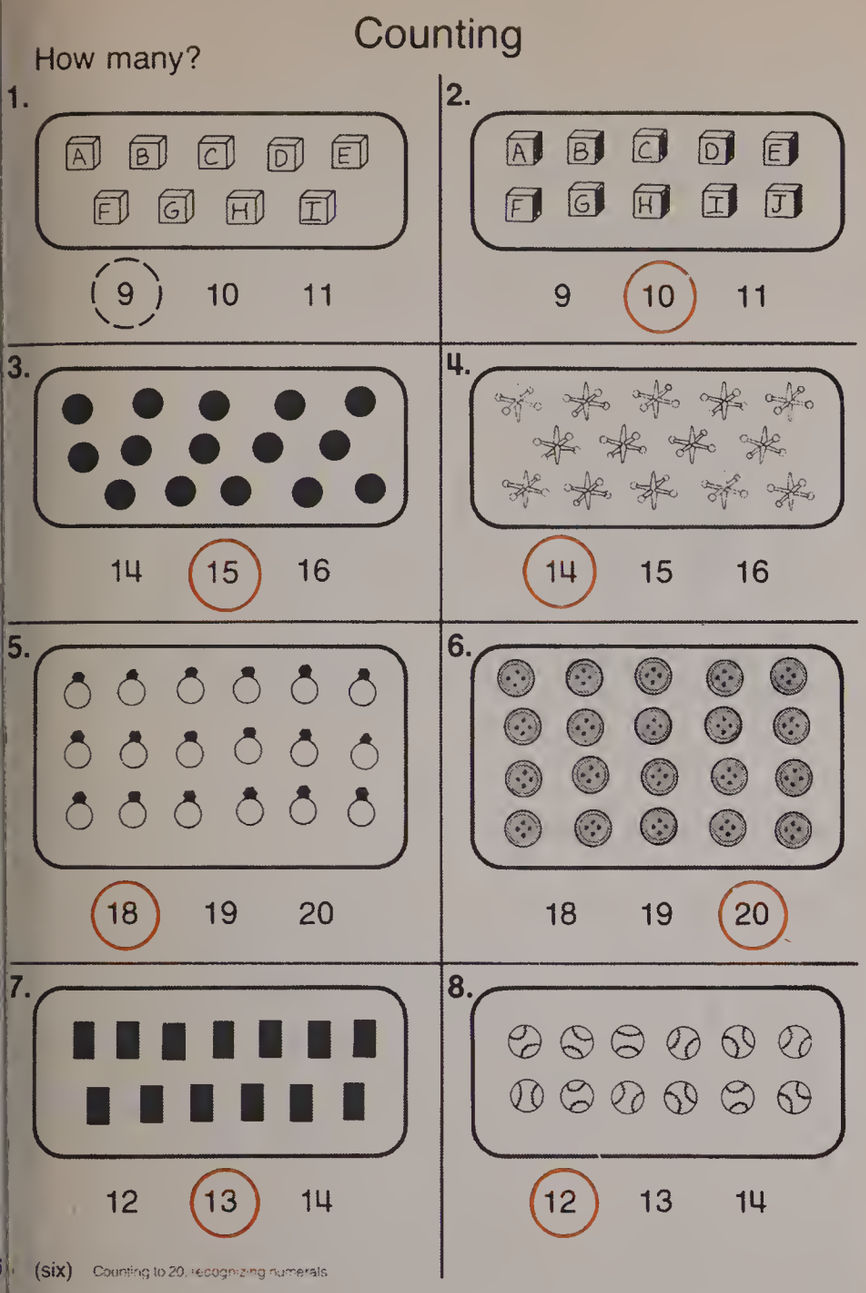
Using the Book Panel 1: Call attention to the picture. Say, "This is a numbe line." Have the child point to the 0. Point out that each of the other numerals shows how far its mark is from 0. Have the child trace over the 0, 1, and 2 and then write the numerals to complete the number line to 9.

Panel 2: Have the child point to and read the numeral on the first iron. Ask, "What number comes just after 8? (9)" Have the child write 9 on the pot Complete the panel in this manner.

Panel 3: Have the child point to and read the numeral on the first pot. Ask, "What number comes just before 7? (6)" Have the child write 6 on the iron. Complete the panel in this manner.

Panel 4: Have the child trace the dashed numerals and continue to write the missing numerals in each sequence. Each hand begins a new sequence.

Panel 5: Have the child write the numerals in order from 0 through 9.



Using the Book Panel 1: Ask, "How many blocks are in panel 1? (9)" Have the child trace over the ring around the 9 below this set. Explain that 9 tells how many blocks are in this set.

Panels 2-8: Have the child count the members in each set, then ring the numeral which tells the number of members. You might wish to have the child guess the number before counting.

When the page is completed, you may ask, "How many blocks are in panel 1? (9) How many blocks are in panel 2? (10) How many more blocks are in panel 2 than in panel 1? (1) Ten is how much greater than nine? (1)" Ask similar questions about panels 7 and 8 to compare the numbers 12 and 13.

OBJECTIVES

To find the number of members in sets with 20 or fewer members
To identify numerals 1 through 20

PACING

Level A	All (1-3 guided)
Level B	All (1-3 guided)
Level C	All

VOCABULARY

ten through twenty

MATERIALS

numeral cards 1-20, 20 beans

SUGGESTIONS

Initial Activities 1. Place numeral cards for 1 through 20 in order from left to right in a row on the chalk rail with blank side showing. Have the child count the cards from left to right. Count the cards again and turn each around so the numeral may be read.

2. Show 15 beans. Ask, "How many?" Have the child count the beans and display the numeral card for 15. Continue with 9 through 20.

ACTIVITIES

1. Shuffle numeral cards for 1 through 20. Have the child arrange the cards in order on the chalk rail or floor. Then the child may count and read the numerals from 1 to 20.

2. Two children may play the game Guess-Take or Give (see Activity Reservoir in the front of the book).

3. Challenge the child to count to 99 using 99 sticks.

4. Involve the child in Bulletin Board suggestion 3 in the Chapter Overview.

OBJECTIVE

To count the members of a set (20 or less) and write the numeral

PACING

Level A All (1-2 guided)
Level B All
Level C All

MATERIALS

numeral cards for 1 through 20, 20 small objects

SUGGESTIONS

Initial Activities 1. Place numeral cards for 1-20 in random order face down. Have the child guess the number of cards, count them, then place them in order. Have the child write the numerals from 10 to 20.

2. Display 11 objects. Ask, "How many?" Have the child count the objects and write the numeral for the number of objects. Continue in this manner using numbers at random from 10 to 20.

ACTIVITIES

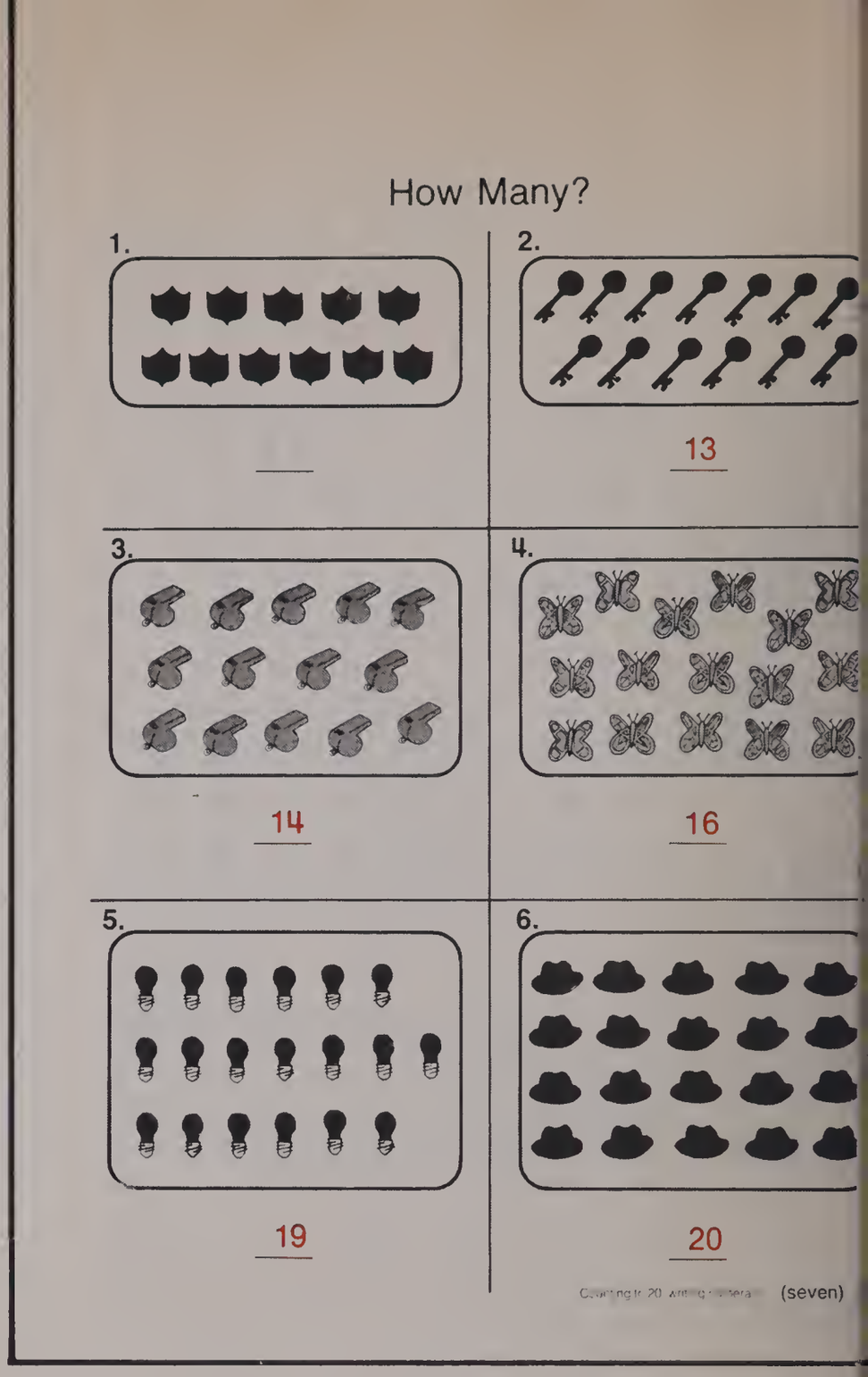
1. Have the child continue the "Number Book." Include pictures for numbers 10-15.

2. On a 10 cm × 15 cm card write:

4	16	3	18	10	9
15	7	6	17	1	20	5
12	8	2	19	11	13

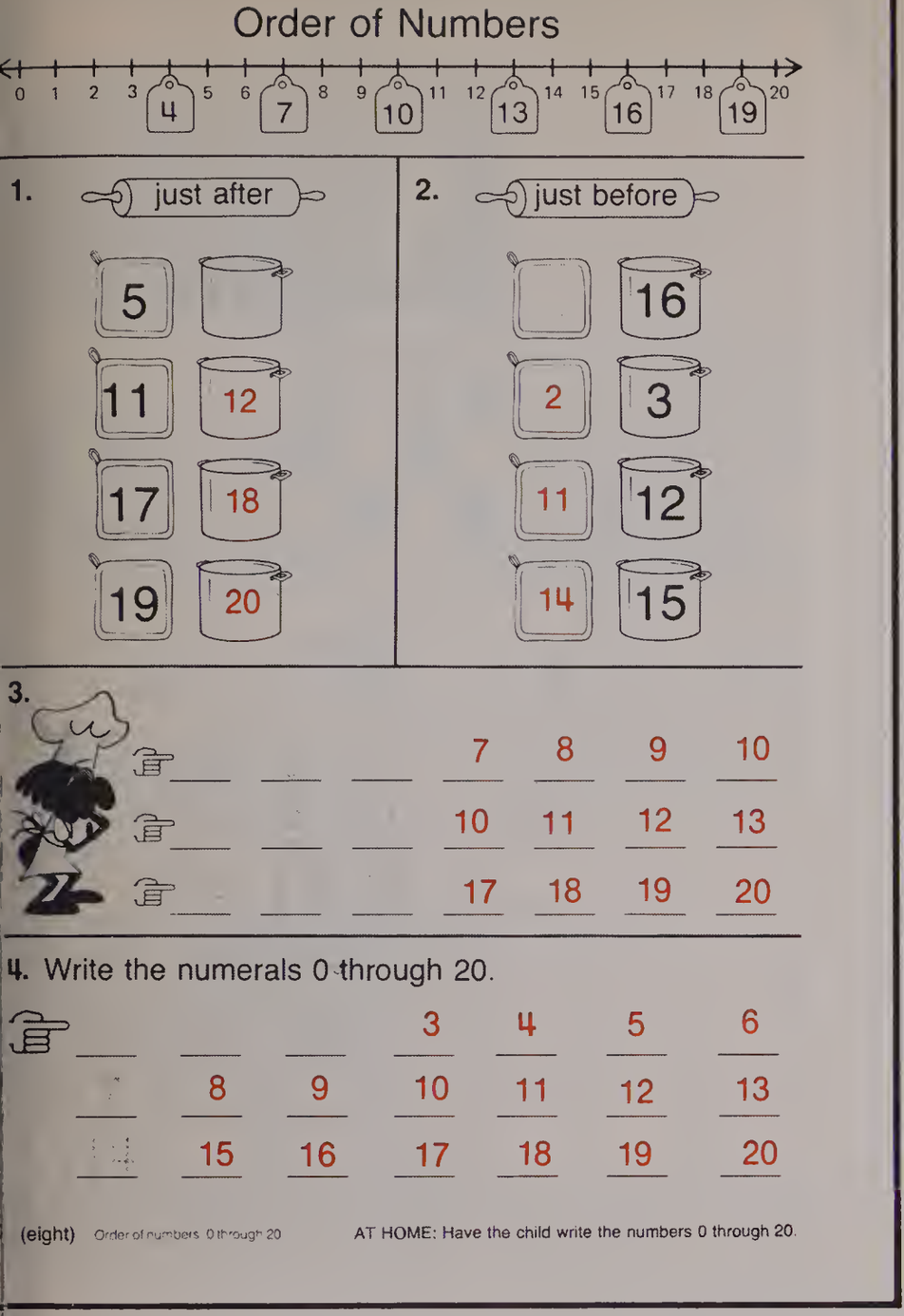
Notice the numeral 14 is missing. Make similar cards, each with one missing numeral between 8 and 20. Use the cards for a game. For each card, the first child to give the missing numeral wins 1 point. 7 points wins the game.

3. Ask, "What numbers between 10 and 20 are not shown on page 7? Write them. (12, 15, 17, 18)"



Using the Book Panel 1: Have the child count the shields in panel 1. Ask, "How many shields? (11)" Have the child trace over 11, which tells the number of members in the set.

Panels 2-6: For each panel, have the child count the members of the set, then write the correct numeral.



sing the Book Have the child read the numerals 0 to 20 from left to right on e number line and touch the tag with 16 on it. Ask, "What number comes st after 16? (17) What number comes just before 16? (15)" Ask similar ıestions about the other tags.

Panel 1: Have the child read the numeral on the first pot holder. Ask, What number comes just after 5? (6)" Have the child trace the 6 on the pot. ɔntinue in this manner for the remainder of the panel.

Panel 2: Follow procedures similar to those for panel 1, except replace ust after" with "just before."

Panel 3: For each row, have the child trace the dashed numerals, find the ttern, then write the missing numerals. Observe that each hand begins a new quence.

Panel 4: Have the child write the numerals in order from 0 through 20. ıe hand indicates a continuous sequence.

t Home After finishing the pupil page, the child may take it home and ɔmplete the At Home activity printed in blue at the bottom of the page.

OBJECTIVE

To know the order of numbers through 20

PACING

Level A All (1-3 guided)
Level B All (1-3 guided)
Level C All

MATERIALS

number line to 20, and numeral cards for 0 through 20

SUGGESTIONS

Initial Activities 1. Place the numeral cards for 0 through 20 in random order on a table. Ask the child to arrange the cards in order from 0 through 20 on a table or on the chalk rail. Ask questions such as "What number comes just after 17? (18) Just before 17? (16)," etc.

2. Use the number line. Ask the child to touch a numeral such as 14. Then ask, "What number comes just after 14? (15) Just before 14? (13)"

ACTIVITIES

1. Have the child complete the "Number Book." Include pictures for numbers 16-20.

2. The child may enjoy playing the guessing game described below.

3. The child may play a guessing game. One child is selected as a leader. The leader selects a numeral card (0-20) such as 12, for example. The leader shows the numeral and says, "My number comes just before (or just after) this number. What is my number?"

4. Challenge the child to write the numerals 0 through 50.

5. Adapt the guessing game above. Challenge the child to work with numbers 20 to 50.

RELATED AIDS

ACT. MASTERS—1-3.
BFA COMP LAB I—2, 3.

OBJECTIVE

To count the members in a set with 20 or fewer members

PACING

Level A	All (1 guided)
Level B	All
Level C	All

SUGGESTIONS

The career illustrated in the picture is salesworkers. See Career Awareness in the Chapter Overview for a discussion of salesworkers and a description of the photo. Before discussing the picture in the text, the child may describe experiences in a variety store. If the child recalls visiting a variety store, ask questions such as "What did you see in the store? About how many of these things did you see in the store? What did you buy? Who sold it to you? (salesclerk)" The child may recall the names of some of the variety stores and should be given an opportunity to tell what they are. Follow this discussion with these questions: "Do salesclerks work with many people? (yes) Who? (other workers, customers) Should salesclerks get along with other people? (yes)"

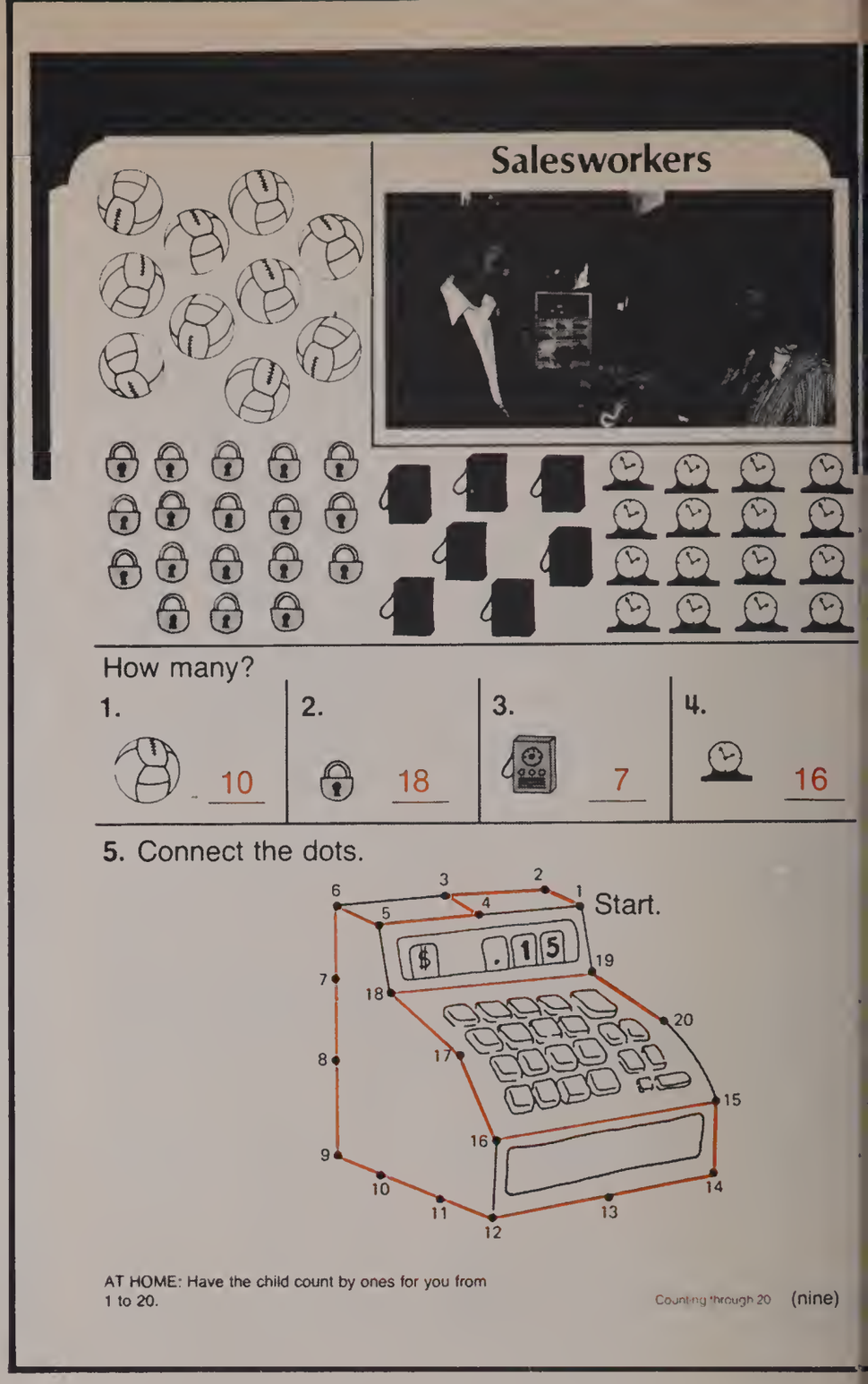
Discuss the consumer aspect of this page—shopping at a variety store. Ask the meaning of sale, better buy, bargain, etc.

ACTIVITIES

1. Ask the child to cut out of newspapers and magazines 20 pictures of things bought in a variety store. Display in a folder entitled "Variety Store."

2. Adapt the "Variety Store" activity above. Have the child use the pictures to make a collage on a sheet of paper or a bottle.

3. Adapt the "Variety Store" activity above and have the child prepare a bulletin board display.



Using the Book Discuss the variety store picture at the top of the page. See Career Awareness in the Chapter Overview. Ask, "Which articles in the picture have you seen in a variety store? (Be sure that the child identifies each of the articles in panels 1–4, basketball, lock, radio, and clock.)" You may want to discuss some things a salesworker does. Ask, "What does the salesworker in the picture sell? Should the salesworker know something about the things he or she sells? What are some of the things they should know?" Continue the discussion by asking the child similar questions about each item in panels 1–4.

Panels 1–4: For each pictured article, have the child write the number of those articles found in the picture at the top of the page.

Panel 5: Have the child start at 0 and connect the dots in order. The result is a cash register.

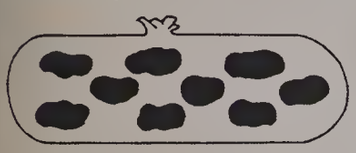
At Home After finishing the pupil page, the child may take it home and complete the At Home activity printed in blue at the bottom of the page.

1. just after

2. just before

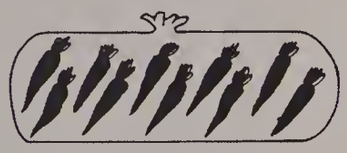
How many?

3.



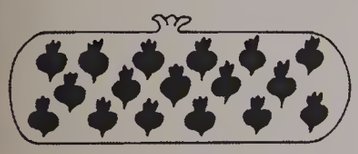
9

4.



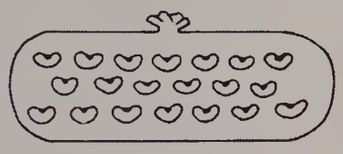
10

5.



17

6.



20

7. Write the missing numerals.

4	5	6	7	8	9	10	11	12
7	8	9	10	11	12	13	14	15
12	13	14	15	16	17	18	19	20

Using the Book This is a diagnostic test. The page references are given for reteaching as needed. The letter indicates the objective.

Panel 1: The child is to write the numeral that comes just after the number named on each badge. [pages 5, 8 C]

Panel 2: The child is to write the numeral that comes just before the number named on each hat. [pages 5, 8 C]

Panels 3-6: For each panel, have the child count the objects in each bag and write the numeral below the set. [pages 6, 7 A, D]

Panel 7: Have the child trace the dashed numerals to find the pattern, then continue to write the missing numerals in each sequence. Observe that each hand begins a new sequence. [page 8 B]

OBJECTIVE

To evaluate achievement of the Chapter Objectives

PACING

Level A	All
Level B	All
Level C	All

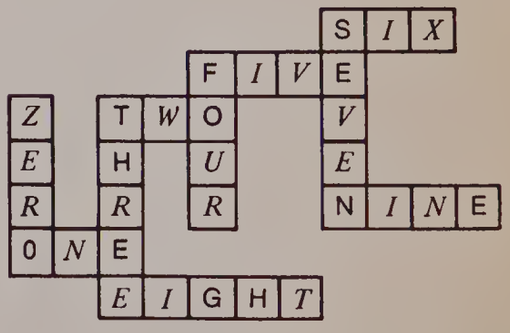
SUGGESTIONS

The Chapter Test is designed to be used in a diagnostic manner. It assesses the child's knowledge of the main concepts and skills that were taught in this Chapter. Some children should take this test independently with guidance for instructions only. Use judgment as to whether certain children should be guided through some or all of the exercises. Check each child's work and mark the items that are incorrect. Reteaching or extra practice might be necessary to help the child acquire the concept or skill that was missed. With this reteaching, you will be able to ascertain whether the child has then learned the topic in question. See Using the Book for page references indicating where the concept or skill was taught.

ACTIVITIES

1. Two children may work with numeral cards 0-20. The children take turns. One child shows one of the numeral cards 0-20. The other child gives the number that comes just before (or just after) this number.

2. Duplicate this "word building" puzzle. The child fills in the missing letters.



Omit the italic letters in the child's puzzle.

CHAPTER 2 OVERVIEW

Number relations greater than, less than, one more than, and one less than are covered in this unit. The child writes sentences such as $7 > 3$ and $2 < 8$. Numbers are used in the ordinal sense. The child also encounters picture graphs and bar graphs.

OBJECTIVES

A To tell which of two numbers, each 20 or less, is greater or less using the signs $>$ and $<$

B To identify the number that is one greater or one less than a given number, answers 20 or less

C To identify the positions of members in an ordered set through the ninth position

D To read and make picture graphs

E To read and make bar graphs

VOCABULARY

is greater than 11
one greater than 12
is less than 13
one less than 14
first through ninth 17
picture graph 19
bar graph 21

BACKGROUND

1. Strictly speaking, "more" and "fewer" are used when comparing the members of two sets. Thus, we may say "set A has more members than set B." Then we use "greater" or "less" when comparing numbers. For example, "7 is greater than 4."

However, we should not stress language to the extent that children become primarily concerned with language and fail to identify the more important concepts (the mathematical ideas). We feel it is better to use the terminology that makes the flow of words easier and does not distract from the mathematical ideas.

2. When the child is first introduced to comparing numbers, he or she compares sets at the same time. Which one of two numbers is greater or less may be determined, however, by comparing their position in the counting sequence. That is, each number is greater than those before it and less than those after it.

The sign $>$ means is greater than; the sign $<$ means is less than. The child may think of each sign as an arrow that always points to the number that is less.

$7 > 3$ is one type of number sentence. $4 + 2 = 6$ is another type of number sentence. Number sentences are either true or false. $7 > 3$ is a true number sentence. $7 < 3$ is a false number sentence.

3. When a number is used to answer the question "How many?" it is used in the cardinal sense. For example, five is used in the cardinal sense in the following statement "There are five children on the bus."

When a number tells "which one" it is used in the ordinal sense. For example, "The child in the fifth seat is my son."

4. Two types of graphs are introduced: picture graphs and bar graphs. In both cases there are horizontal and vertical graphs. At this stage, each picture in a picture graph represents exactly one member of a set. In higher grades, each picture of a picture graph may represent two or more members of a set. Each colored box in a bar graph represents exactly one member of a set.

MATERIALS

blocks in different colors (20 each)
flannel or magnetic board
felt or magnetic shapes
yarn
long paper for number line 0 through 20
numeral cards for 0 through 9
word cards for one through nine
word cards for first through ninth
9 small objects
10 paper fish
horizontal and vertical picture graphs
bar graphs (horizontal and vertical)

CAREER AWARENESS

Painters [18]

Painters are skilled craftspeople who apply paint, varnish, and other finishes to surfaces to decorate or protect them. Often they must remove loose paint and grease, fill nail holes and cracks, and sandpaper rough spots. They must be skilled in handling brushes and other painting tools and in matching colors. Painters often use rollers or spray guns instead of brushes. Rollers are used on even surfaces that are difficult to paint with a brush. Both rollers and spray guns permit faster painting, thus reducing labor costs. Since painters often go into people's homes or shops, they must be able to get along with people and take care not to spill paint or damage furniture, etc.

It is important that children develop an awareness of self and others. Children should realize that painters rely on customers for their income. It is necessary for painters to interact with others and in satisfying customers with their work, they insure their reputation and earnings.

Photo description: The painter in the foreground is using a brush to apply paint around the light switch. Behind her, the other painter is using a roller on a larger area. A painter makes the surface smooth before starting to paint by filling in uneven surfaces and holes with plaster.

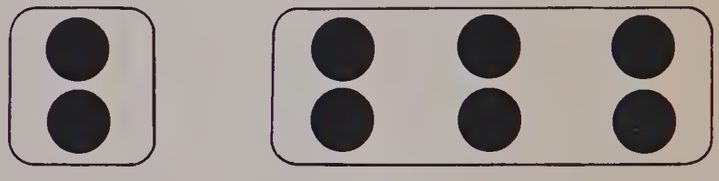
BULLETIN BOARD

1. Have the children collect pictures cut from magazines. On each picture, they write the numeral that names the number of their set. Tack up a picture showing, for example, a set with 6 well-spaced members. The children are to compare their pictures with this model as shown below. Provide a set of numeral cards for each number illustrated by the children's pictures and several cards for $>$ and $<$.

4	$<$	6
(from a classmate's picture)		(from the model picture)

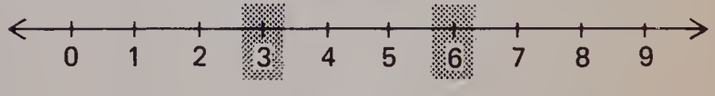
Use the dismantling of the bulletin board as a learning tool. Have a child take down all the sets with one member. Continue to have other children remove set pictures in a "one more order."

2. Select a group of children to make posters showing the meaning of the "is greater than" and "is less than" signs. They may show two sets, a word sentence, and a number sentence, such as:



2 is less than 6
$2 < 6$

3. Have a child make a poster showing how the number line may be used to show "is greater than" and "is less than." Use colors to emphasize the relations.



$3 < 6$
$6 > 3$

OBJECTIVES

To tell which of two numbers is greater

PACING

Level A All (1-2 guided)
Level B All (1-2 guided)
Level C All (1-2 guided)

VOCABULARY

is greater than

MATERIALS

flannel or magnetic board, 9 felt or magnetic shapes, and yarn

BACKGROUND

See Item 1 in Chapter Overview Background.

SUGGESTIONS

Initial Activity Use a transparency or flannel board felt shapes to develop the idea that 7 members is more than 4 members. Display a set of 7 members and a set of 4 members on the flannel or magnetic board. Ask the child to use yarn to match the members of the two sets. Have another child show the number of each set. Ask, "Which set has more members? Which number is greater, 7 or 4?" Write and read: 7 is greater than 4.

ACTIVITIES

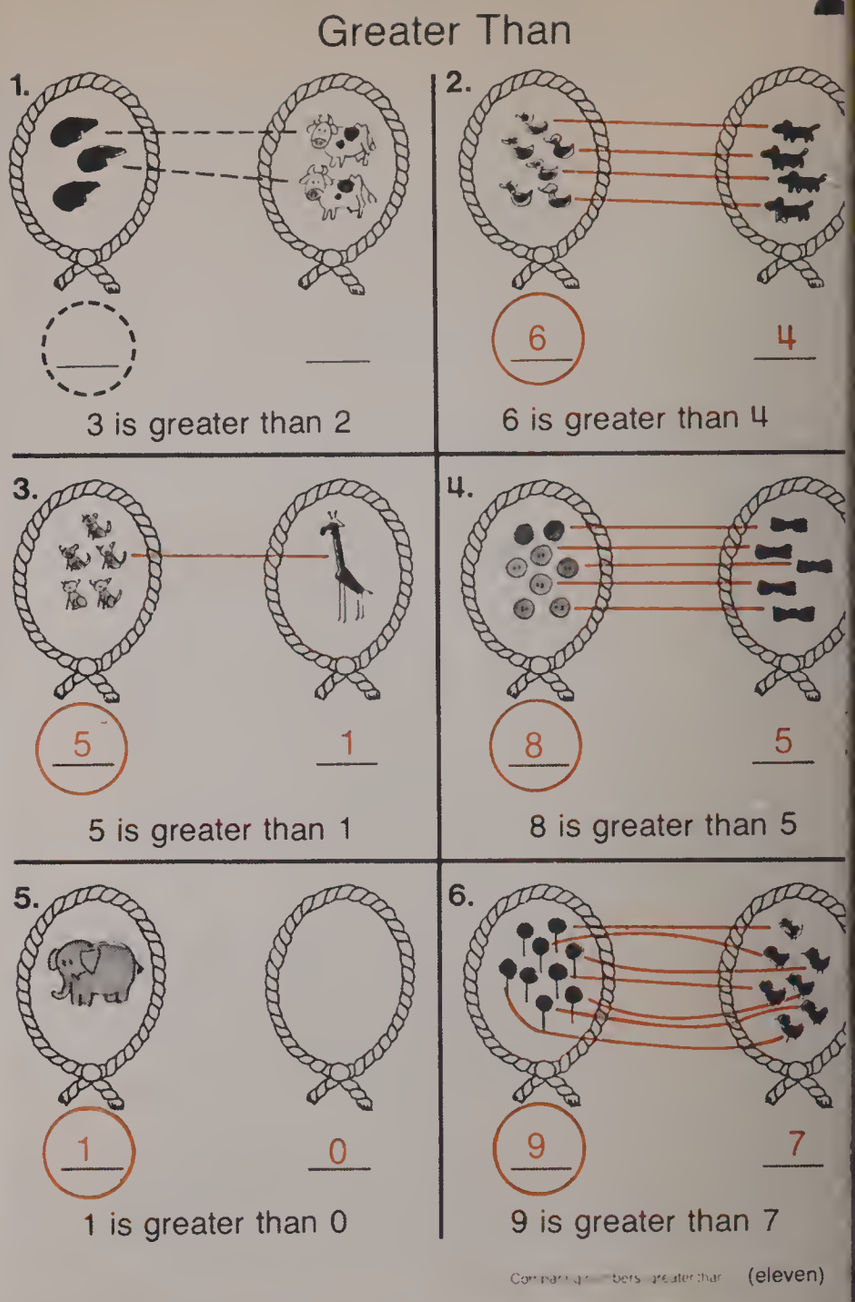
1. Distribute set cards with 0 through 9 members, a set of numeral cards for 0-9, and a card strip with the words "is greater than." Have the child use the materials to make sentences about pairs of numbers.

2. Have the child select pairs of numeral cards, tell which number is greater, and make a sentence such as "5 is greater than 1."

3. Have the child play the game Battle described in the Activity Reservoir.

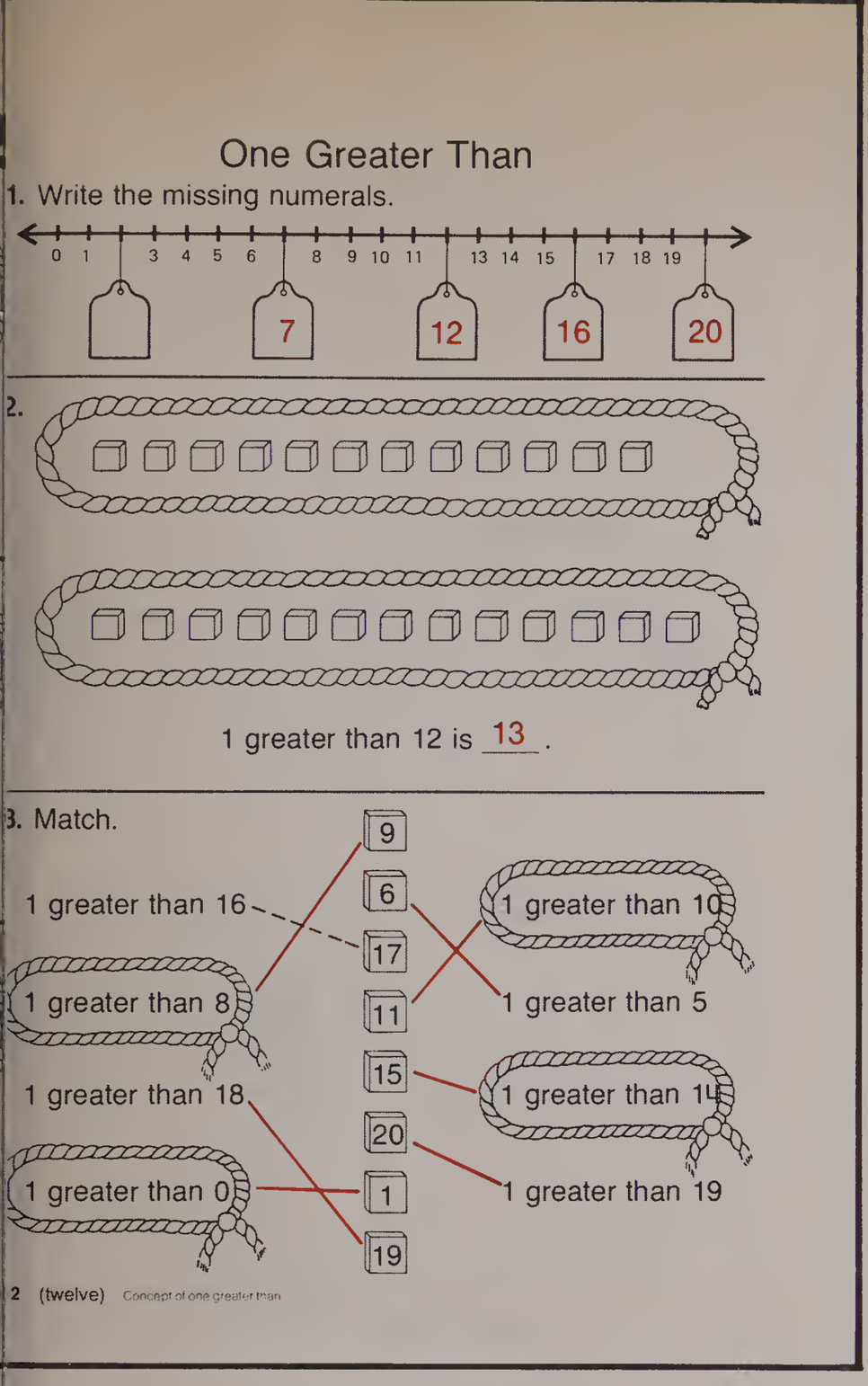
RELATED AIDS

BFA COMP LAB I—4.
BFA PROB. SOLVING I—7, 9-12.



Using the Book Panel 1: Have the child describe each set. Then trace the dashed lines to match the members of the sets. Ask, "How many whistles? (3, trace the 3.) How many cows? (2, trace the 2.) Which number is greater, 3 or 2? (3)" Have the child ring the 3. Then have the child read the sentence, "3 is greater than 2."

Panels 2-6: For each panel, have the child match the members of the two sets and write the numeral for the number of each set in the blank below. The child then rings the numeral of the greater number and reads the sentence.



Using the Book Panel 1: Have the child complete the number line by writing the correct numerals on the tags.

Panel 2: The child may pair the members of the two sets. Ask, "Which set has more members? (yellow) How many more? (1)" Have the child count the members of each set and write the appropriate numerals on each set. Ask, "One greater than 12 is what number? (13)" Have the child write 13 in the blank. You may have the child touch 12 on the number line. Ask, "What number is one greater than twelve? (13)"

Panel 3: Ask, "One greater than 16 is what number? (17)" Have the child trace over the line to the box with 17. Then have the child match each phrase with a box that shows the answer.

OBJECTIVE

To find the number that is one greater than a given number

PACING

Level A	All (1-2 guided)
Level B	All (1-2 guided)
Level C	All

VOCABULARY

one greater than

MATERIALS

11 blocks, number line 0-20

SUGGESTIONS

Initial Activities 1. Show a set with 5 members. Ask the child to give the number of the set and show another set with one more member. Ask, "What is the number of your set? (6)" Write:

1 greater than 5 is ___

Have the child fill in the blank.

2. Use a number line. Ask, "What number comes just after 17? What number is 1 greater than 17?"

ACTIVITIES

1. Play Battle, described in the Activity Reservoir.

2. Pair children for a game, Show and Tell. Shuffle numeral cards 0-19. Each child takes turns pulling from the deck. The 1st child pulls and shows the number on the card. The 2nd child must tell the number that is one greater by saying "1 greater than 14 is 15." If correct, the 2nd child takes the card. If incorrect, the 1st child keeps the card. The child with the greater number of cards when the deck is used up wins.

3. Adapt the game Show and Tell above. Use numeral cards 20-50.

RELATED AIDS

BFA COMP LAB I—4, 5.
BFA PROB. SOLVING I—7, 9-12.

OBJECTIVE

To tell which of two numbers is less

PACING

Level A All (1-2 guided)
Level B All (1-2 guided)
Level C All (1 guided)

VOCABULARY

is less than

MATERIALS

9 blocks, numeral cards for 0-9

SUGGESTIONS

Initial Activity Use a set of 3 blocks and a set of 6 blocks. Develop the idea that 3 blocks are fewer than 6 blocks, so 3 is less than 6. Write:

__ is less than __

Have the child complete the sentence and ring the number that is less.

ACTIVITIES

1. Give the child the set cards with 0-9 dots, numeral cards 0-9, a strip card for "is less than." The child shows pairs of sets. Each time, the child shows the number of each set and makes sentences such as "4 is less than 9."

2. Give two children the numeral cards for 0-9, face down. Each child takes a card and makes a sentence for the card he or she is holding, such as:

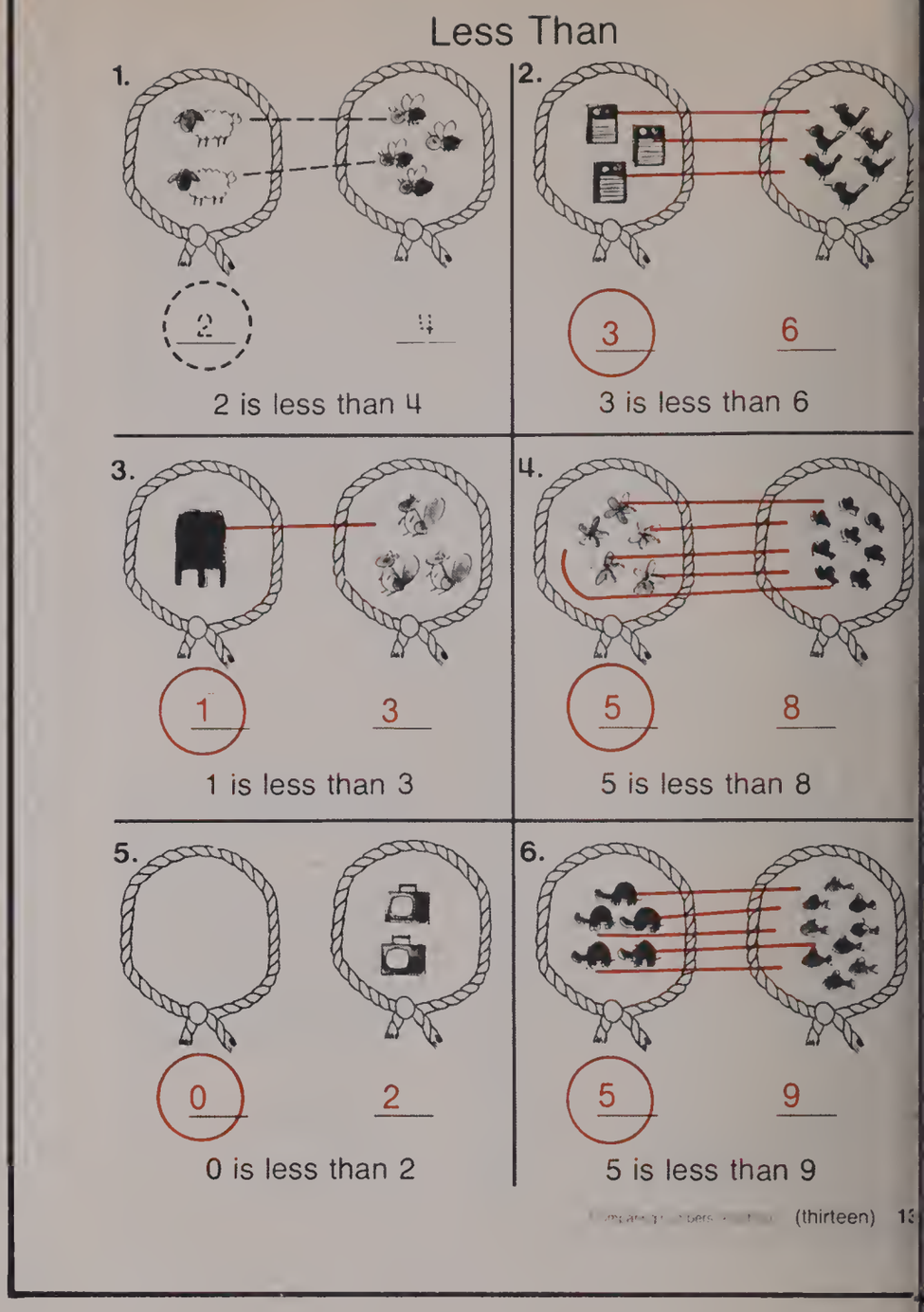
3 is less than 7
7 is greater than 3

3. Have the child play the game Battle. See the Activity Reservoir in the front of the book.

4. Have the child make sentences about pairs of numbers greater than 20 such as, "34 is less than 41," and "41 is greater than 34."

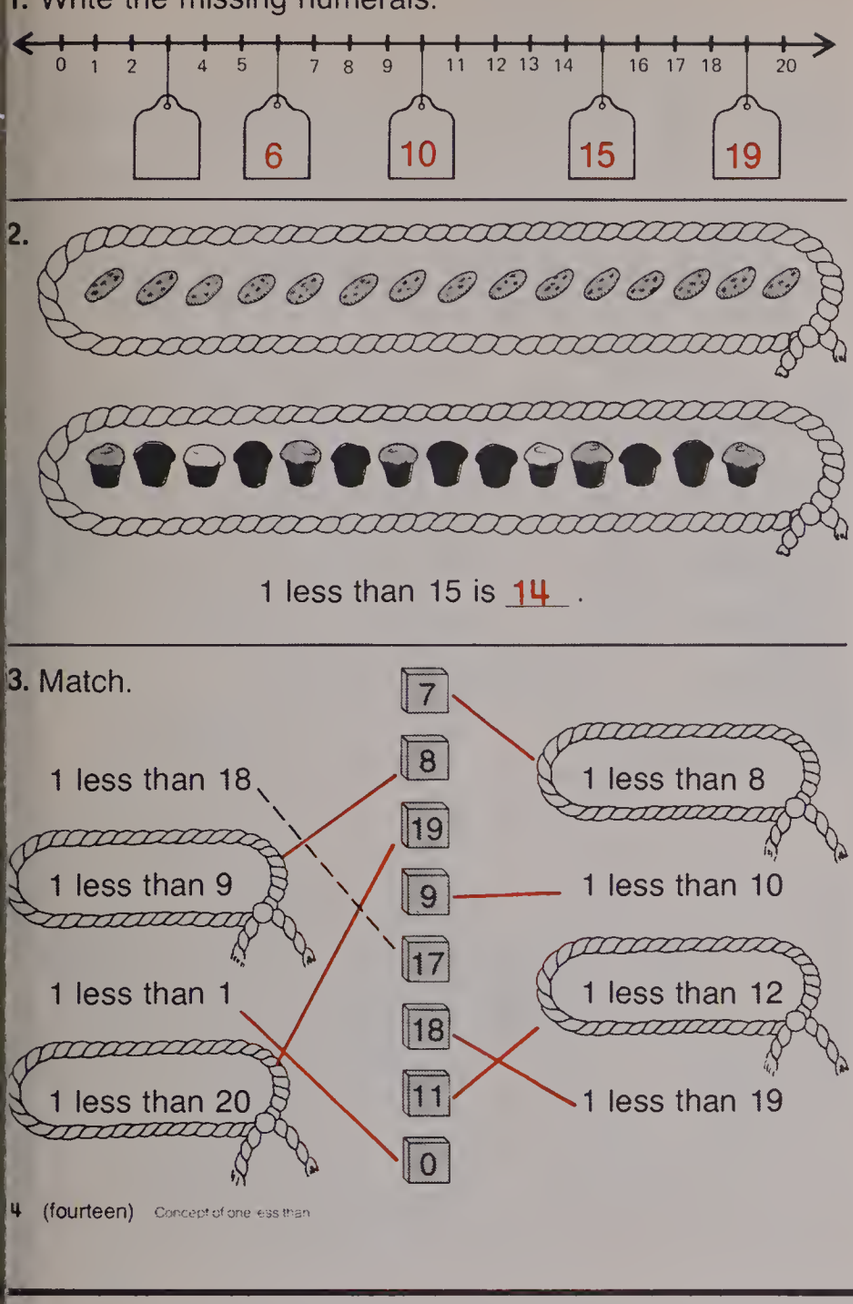
RELATED AIDS

BFA COMP LAB I—6.
BFA PROB. SOLVING I—8-12.



Using the Book Panel 1: Have the child describe each set. Then trace the lines to match the members of the two sets. Ask, "How many lambs? (2. trace the 2.) How many bees? (4. trace the 4.) Which number is less, 2 or 4? (2)" Have the child ring the 2. Then have the child read the sentence, "2 is less than

Panels 2-6: For each panel, have the child match members of the two sets and give the number of each set in the blank below. The child then rings the numeral for the number that is less, and then reads the sentence.



Using the Book Panel 1: Have the child complete the number line by writing the correct numerals on the tags.

Panel 2: Have the child pair the members of the two sets. Ask, "Which set has fewer members? (cupcakes) How many fewer? (1)" You may have the child count the members of each set and write the appropriate numeral on each set. Ask, "One less than 15 is what number? (14)" Have the child read and complete the sentence. You may have the child touch 15 on the number line. Ask, "What number comes just before 15? (14) What number is one less than 15? (14)"

Panel 3: Ask, "1 less than 18 is what number? (17)" Have the child trace over the line to the box with 17. Then have the child match each phrase with a box that shows the answer.

OBJECTIVE

To find the number that is one less than a given number

PACING

Level A	All (1-2 guided)
Level B	All (1-2 guided)
Level C	All

VOCABULARY

one less than

MATERIALS

13 blocks, number line

SUGGESTIONS

Initial Activities 1. Show a set with 7 members. Ask the child to give the number of the set and show another set with one less member. Ask, "How many are in your set? (6) What number is one less than 7? (6)" Write:

1 less than 7 is ___

Have the child fill in the blank.

2. Ask the child to touch 9 on the number line. Ask, "What number comes just before 9? (8) What number is one less than 9? (8)"

ACTIVITIES

1. Two children may take turns playing this game. One child holds up one of the numeral cards from 1 to 20. The other child tells the number that is one less.

2. Give the child a worksheet:

One less		One greater
_____	18	_____
_____	6	_____
_____	11	_____

And so on for numbers 19 or less.

3. Adapt the worksheet activity above. Challenge the child to complete a worksheet for numbers 15 through 30.

RELATED AIDS

BFA COMP LAB I—6.
BFA PROB. SOLVING I—8-12.

OBJECTIVE

To write > or < to make true sentences

PACING

Level A All (1-4 guided)
Level B All (1-2 guided)
Level C All

MATERIALS

11 blocks

BACKGROUND

See Item 2, Chapter Overview Background.

SUGGESTIONS

Initial Activities 1. Show a set of 8 blocks on the left of a set of 3 blocks. Have the child give the number of each set. Ask, "Which set has more members? (set of 8) Which number is greater, 8 or 3? (8)" Write: 8 is greater than 3. Tell the child there is a sign for "is greater than." Write:

8 is greater than 3
8 > 3

Have the child read each sentence.

2. Now show a set of 4 blocks on the left of a set of 7 blocks. Adapt the above activity for:

4 is less than 7
4 < 7

Notice that the signs > and < always point to the smaller number.

ACTIVITIES

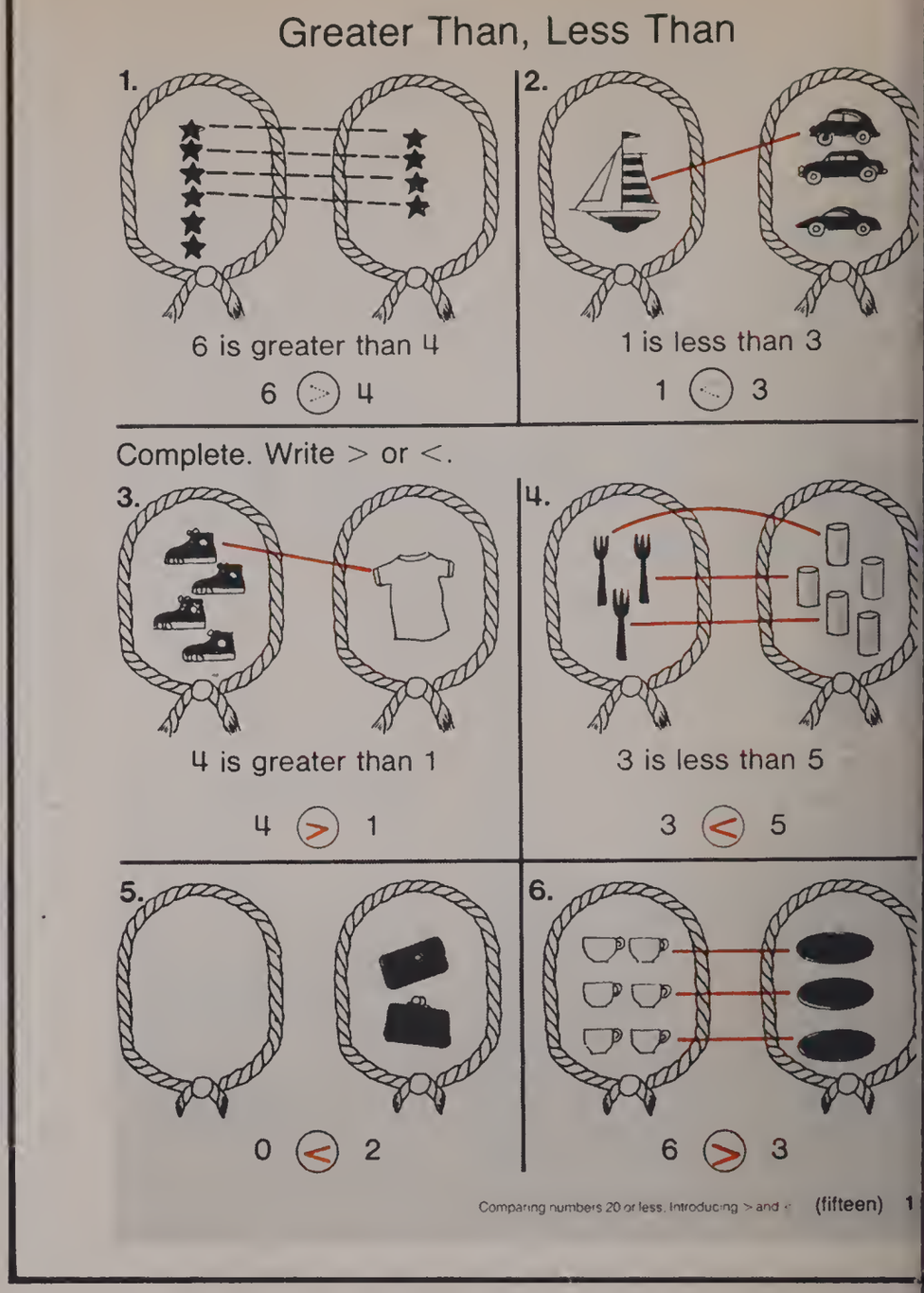
1. See Bulletin Board suggestion 1 in the Chapter Overview.

2. See Bulletin Board suggestion 2. Display around the classroom.

3. Distribute numeral cards for 0-9, and a card each for > and <. Turn the numeral cards face down. The child selects any two numeral cards, turns them face up, then places the > or < card between them and reads the sentence. The other children check to see if the sentence is correct.

RELATED AIDS

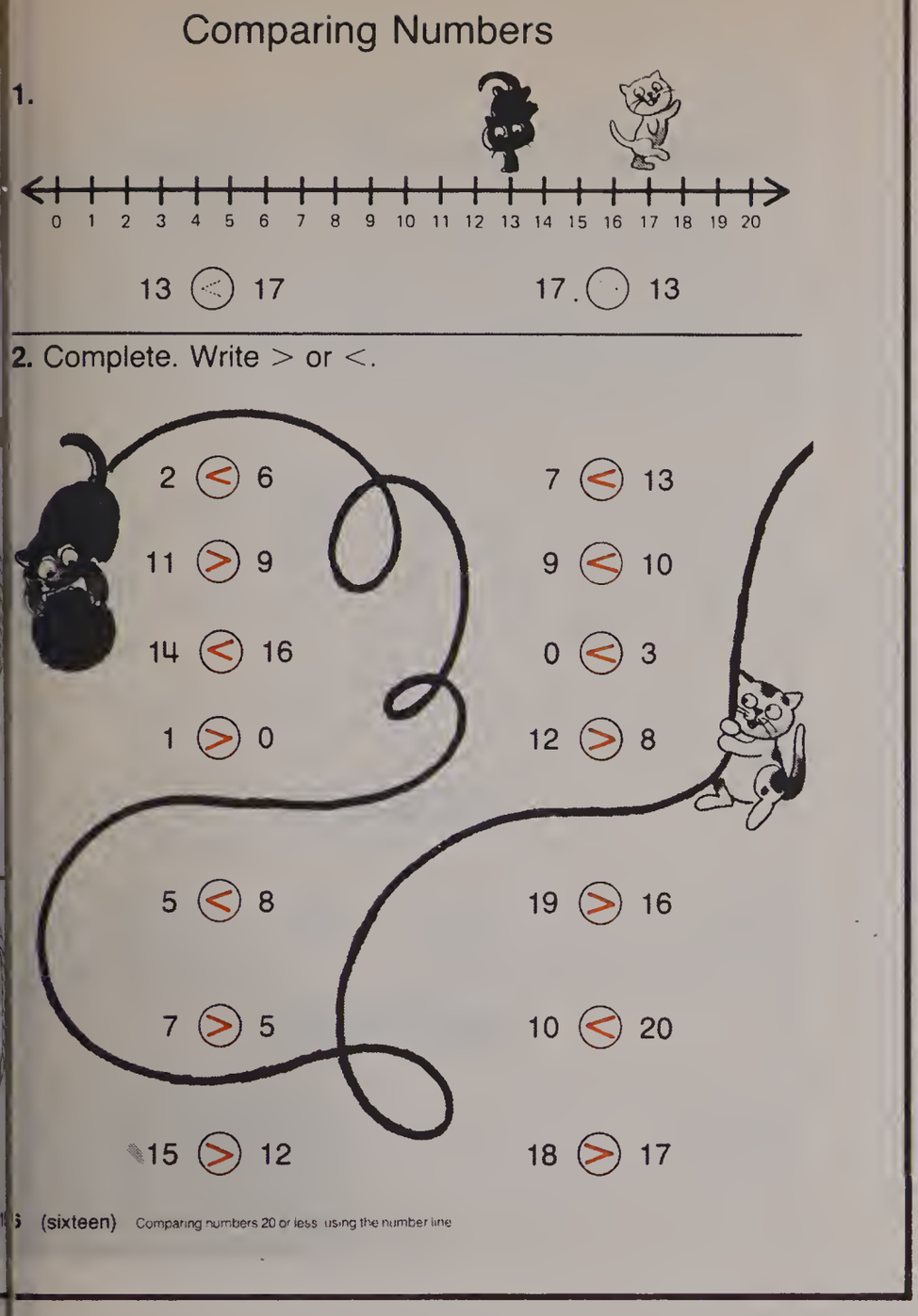
BFA COMP LAB I—4-6, 43.
BFA PROB. SOLVING I—7-12.



Using the Book Panels 1-2: Have the child describe each set. Then trace over the lines to match the members of the two sets. Have the child write the numbe of each set on the set and tell which set has more or fewer members. Assist the child in reading the sentence comparing the two numbers. Point out the symbol for is greater than, >, and is less than, <, and have the child trace the symbol in the ring to make a true sentence.

Panels 3-4: Tell the child to pair members of the two sets in each panel. The child may give the number of each set by writing the numeral on the set. T child then reads the first sentence and writes > or < in the ring to make a true sentence.

Panels 5-6: The child may use the sets to help determine which sign, > or <, to write in each ring.



Using the Book Panel 1: Tell the child to touch the 13 and the 17. Ask, "Which comes first when counting, 13 or 17? (13) Which number is less, 13 or 17? (13) Which number is greater, 13 or 17? (17)"

Assist the child, if necessary, in reading the sentences below the number line. Then have the child trace over the is less than sign, <, and the is greater than sign, >.

Panel 2: Tell the child to write > or < in each ring to make a true sentence. The number line may be used to help decide which of the two numbers is greater or less). You may have the child read some of the sentences when the assignment has been completed.

OBJECTIVE

To write > or < to make true sentences

PACING

Level A	All (1 and parts of 2 guided)
Level B	All (1 guided)
Level C	All

MATERIALS

15 blocks, number line

SUGGESTIONS

Initial Activities 1. Show a set of 10 blocks and a set of 5 blocks. Have the child count the blocks in each set. Ask, "Which set has more blocks? (set of 10) Which number comes first when counting, ten or five? (5) Which number is greater, ten or five? (10)" Discuss the idea that when counting, each number is greater than those that come before it and less than those that come after it.

2. Show a number line 0-20. Have the child touch 9 with one hand and 4 with the other. Ask, "Which number comes first when counting, 9 or 4? (4) Which number is greater, 9 or 4? (9) Which number is less, 9 or 4? (4)" Ask the child to write $9 > 4$, then write $4 < 9$.

ACTIVITIES

1. Provide 3 children with numeral cards for 0-20 and a card each for > and <. One child selects two numbers; the other child uses the correct sign; the third child reads the sentence.

2. Pair children together. Name one child "greater than" and the other child "less than." Place a set of numeral cards 0-20 face down on the worktable. Each child chooses a numeral card, then uses the two numbers along with his or her name (that is, > or <) and writes a true sentence. For example, $4 < 12$ and $12 > 4$.

3. See Bulletin Board suggestion 3 in the Chapter Overview.

RELATED AIDS

BFA COMP LAB I—4-6, 43.
BFA PROB. SOLVING I—7-12.

OBJECTIVE

To identify the first through the ninth members in an ordered set

PACING

Level A	17 All (1-3 guided)
	18 All
Level B	17 All (1-3 guided)
	18 All
Level C	17 All (1-2 guided)
	18 All

VOCABULARY

first through ninth

MATERIALS

9 objects, numeral and word cards for 1 through 9, word cards for first through ninth

BACKGROUND

See Item 3 of the Chapter Overview Background.

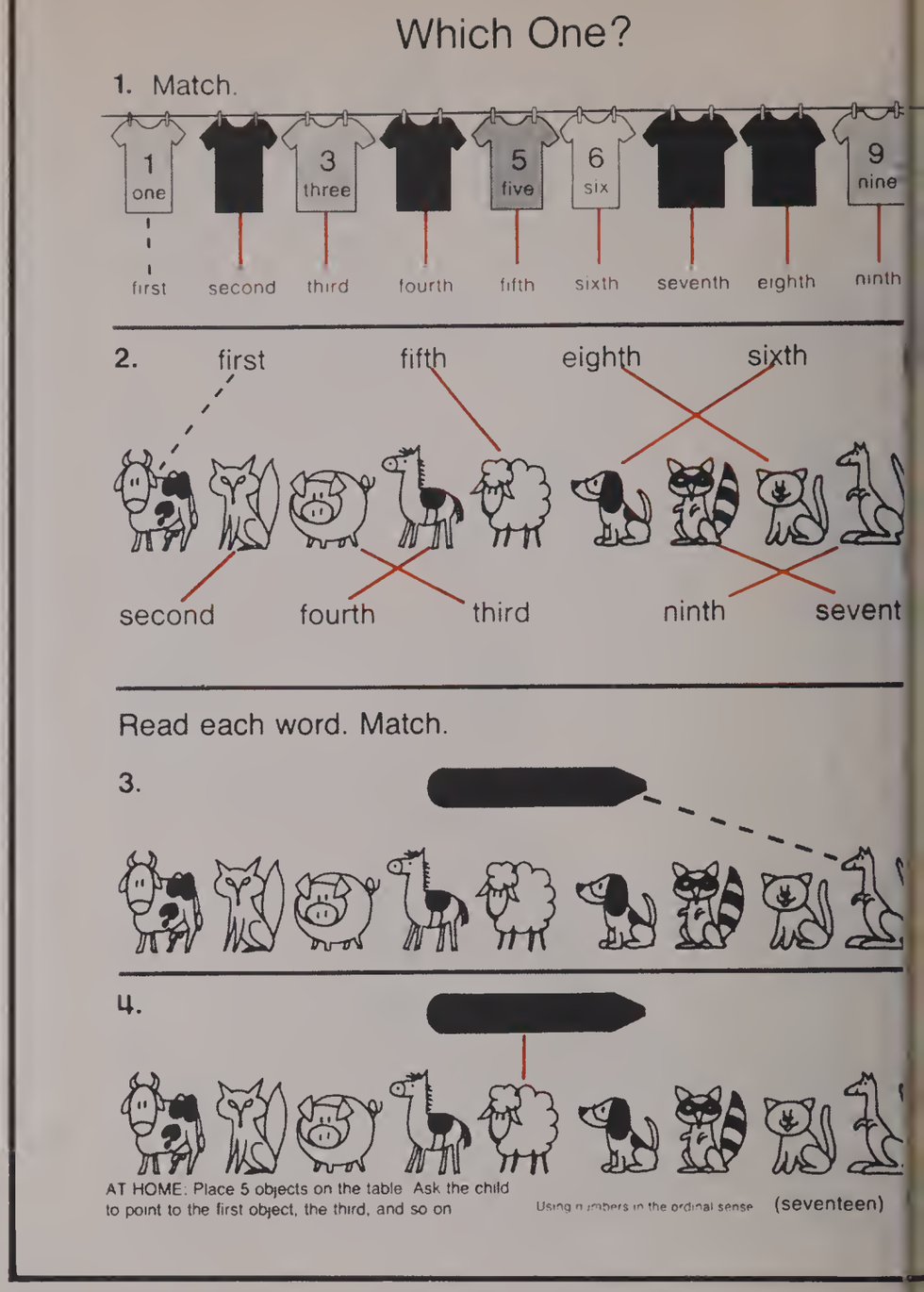
SUGGESTIONS

Initial Activities Arrange 9 objects in a row. Ask the child to count them from left to right and match the numeral cards for 1 through 9 with the objects. Then have the child match the number words, one through nine, with the numerals.

Have the child identify the first through ninth object with as little assistance as possible. Have the child touch the seventh object, the second object, and so on.

Finally, the child matches the word cards for first through ninth with the objects.

The career on page 18 is painters. Ask children to name different things that painters paint (houses, apartments, stores, etc.). Point out that since painters sometimes go into people's homes and stores, they must be courteous.



Using the Book Panel 1: Tell a story. "Some shirts are on a line. Each shirt i in a special place." Have the child count the shirts and touch each shirt as it is counted. Say, "The pink shirt is first on the line. Trace the line to match the pink shirt with the word first below it." Ask, "In which place is the orange shir (second)" Draw a line from the orange shirt to the word second. Continue in this manner through the ninth shirt, having the child match each shirt with the word that tells its position on the line. Afterwards, ask questions such as, "In which place is the yellow shirt? (4th) The green shirt? (7th)" Also ask questions such as, "Which shirt is in the third place?"

Panel 2: Have the child match each animal with the word above or below that gives the animal's place in the row from left to right.

Panels 3-4: Tell the child that each crayon has a word on it. The word tells which animal in the row to match with the crayon.

At Home After finishing the pupil page, the child may take it home and complete the At Home activity printed in blue at the bottom of the page.

Read each word. Match.

1. third

2. sixth

3. eighth

4. second

PAINT PAINT PAINT PAINT PAINT PAINT PAINT PAINT PAINT

8 (eighteen) Practice

Using the Book Encourage the child to discuss the picture, telling the things he or she knows about painters. Then you may use your knowledge of painters and tell the child something about the skilled trade of painting. (See Career Awareness in the Chapter Overview.)

Panels 1-4: Tell the child that each panel shows a tool used by painters. Assist the child in identifying each tool and telling how is it used. Then tell the child, "For each panel, read the word on the crayon, then draw a line from the crayon to the tool in that position." You may wish to have the child mark an X on the tool in each position before the line is drawn.

ACTIVITIES

1. You may wish to call attention to Panel 2, page 17. Ask the child to count the animals from left to right and write the numerals as animals are counted. Then ask, "What animal is fifth? What animal is ninth?" and so on.

2. Have the child gather some information from a painter (or parent) about the tools not shown on page 18. (Examples: small putty knife, scraper, etc.)

3. Have children form a line to provide experiences with identifying positions on the line. For example, ask the eighth child to change places with the second child, etc.

4. Have the child cut from magazines or newspapers, 9 pictures of painters' tools. The child should arrange them in a row and name each tool using an ordinal word.

5. It might be fun for the child to work with lollipops of 5 different colors. Play a game in which the child lines up the lollipops according to instructions such as, "the first one is green, the second is orange," and so on.

6. Ask the child to cut from magazines, pictures of painters' tools. Have the child sort them in rows showing greater to less. For example, 5 brushes, 3 rollers, 1 can of paint.

OBJECTIVES

To read and make horizontal picture graphs
To read and make vertical picture graphs

PACING

Level A	19	All (guided)
	20	All (guided)
Level B	19	All (1 guided)
	20	All (1 guided)
Level C	19	All
	20	All

VOCABULARY

picture graph

MATERIALS

10 paper fish, horizontal picture graphs

BACKGROUND

See Item 4 in the Chapter Overview Background.

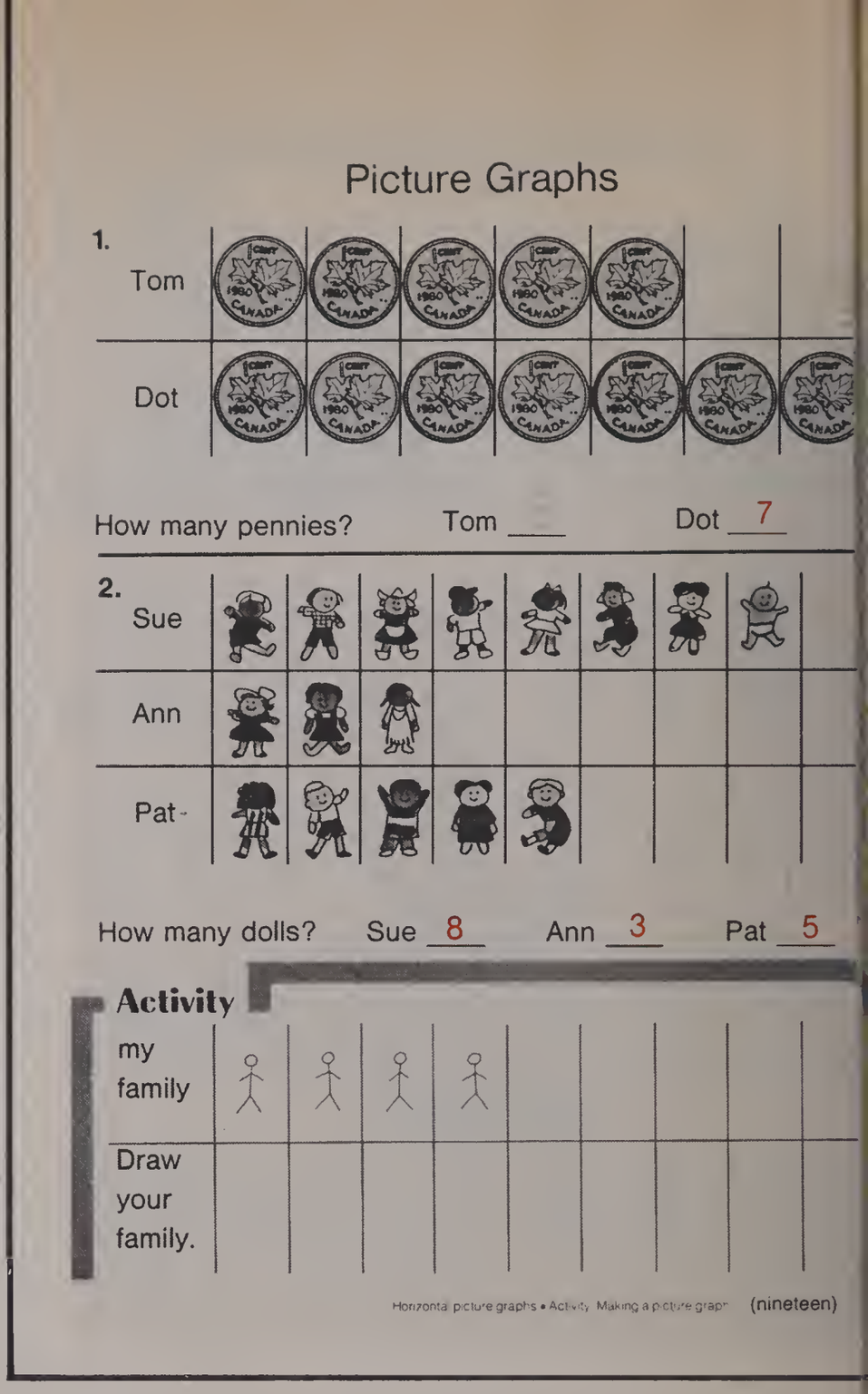
SUGGESTIONS

Initial Activities 1. For page 19, show two rows of paper fish. (6 fish, 4 fish) Pin a name on the left of each row, Joe and Ali. Tell the child the two children went fishing. The picture graph shows how many fish each child caught. Ask, "Who caught more fish? How many did Joe catch? How many did Ali catch?" Discuss the orderly arrangement of this graph.

2. For page 20: From the worktable, select a simple horizontal picture graph. Have the child describe the graph.

Tell the child that some picture graphs show the pictures in a column rather than in a row. Have the child help construct a vertical picture graph. Let the child select the topic of the graph. Keep these graphs for page 22.

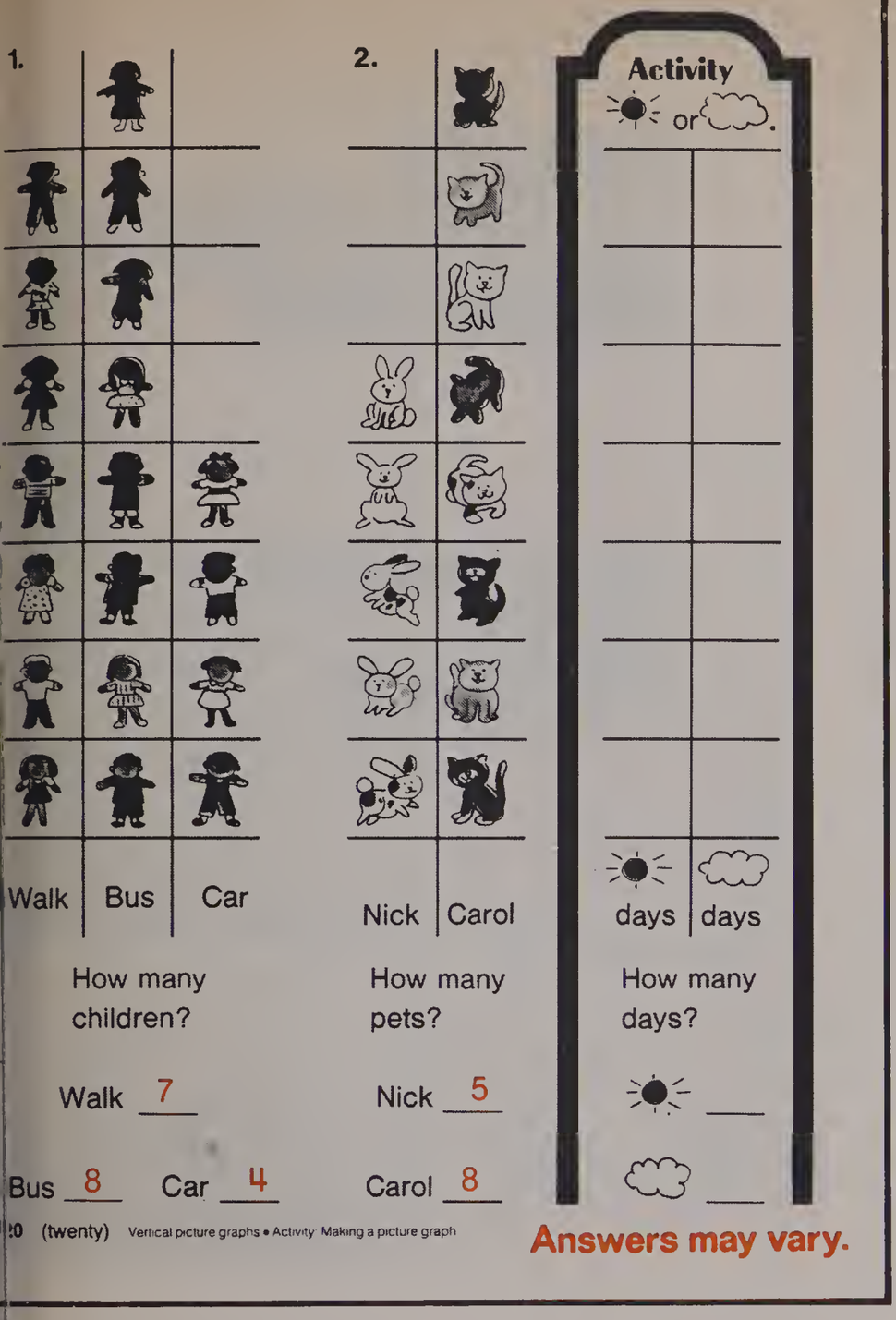
For the consumer aspect of this page, discuss the idea of saving money.



Using the Book Panel 1: The picture graph shows how many pennies each child has. Ask, "How many pennies does Tom have? (5) How many pennies does Dot have? (7)" Read the sentence, "How many pennies?" Have the child give the number of pennies each has. Ask, "Who has more pennies? (Dot)"

Panel 2: Follow the same procedure as in panel 1.

Activity: Tell the child that each stick figure shows a member in "my family." Ask, "How many members in my family? (4)" In the second row, have the child draw a stick picture for each member in his/her family, including himself/herself. When the child has completed the exercise, ask, "How many in my family? How many in your family?"



Using the Book Panel 1: The picture graph shows how a group of children usually come to school. Ask the child to guess what the words below the columns mean. (Children who walk, who ride a school bus, and who ride in a car.) Then the child counts the children who travel by each method and records the answer.

Panel 2: The picture graph shows how many pets Nick and Carol have. The child writes how many pets each has. Ask, "Who has more pets? (Carol)"

Activity: This picture graph is to be completed over a period of up to 7 school days. Each day, the child decides whether it is sunny or cloudy and draws a picture of the sun or a cloud in the appropriate frame. At the end of the period of time, the child tells how many sunny days there were and how many cloudy days there were. Ask, "Were there more sunny or more cloudy days during the week?"

Talk about piggy banks and commercial and savings banks.

ACTIVITIES

1. Have the child make a picture graph. Provide the child with a duplicated graph and 5 to 8 discs, each cut from two different colours of construction paper.

2. Involve several children in making a large horizontal picture graph comparing the birthdays of boys and girls in the class for this month. Use pictures of girls in first row and pictures of boys in second row.

3. You may have the child or a group of children construct vertical picture graphs for the worktable. Provide the child with a duplicated grid or assist the child in making one. Have the child select the topic of the graph. Paste the grid to cardboard and construct a graph in a collage-like manner by pasting objects instead of drawing pictures. Other children may use the graphs for additional study.

4. Have a group of children make a horizontal picture graph similar to that in Panel 1, page 19, for their own savings. Provide a large lined poster for this graph.

OBJECTIVES

To read and make horizontal bar graphs
To read and make vertical bar graphs

PACING

Level A	21 All (guided)
	22 All (guided)
Level B	21 All (guided)
	22 All (1 guided)
Level C	21 All (1 guided)
	22 All (1 guided)

VOCABULARY

bar graph

MATERIALS

graphs from Initial Activity on pages 19-20

BACKGROUND

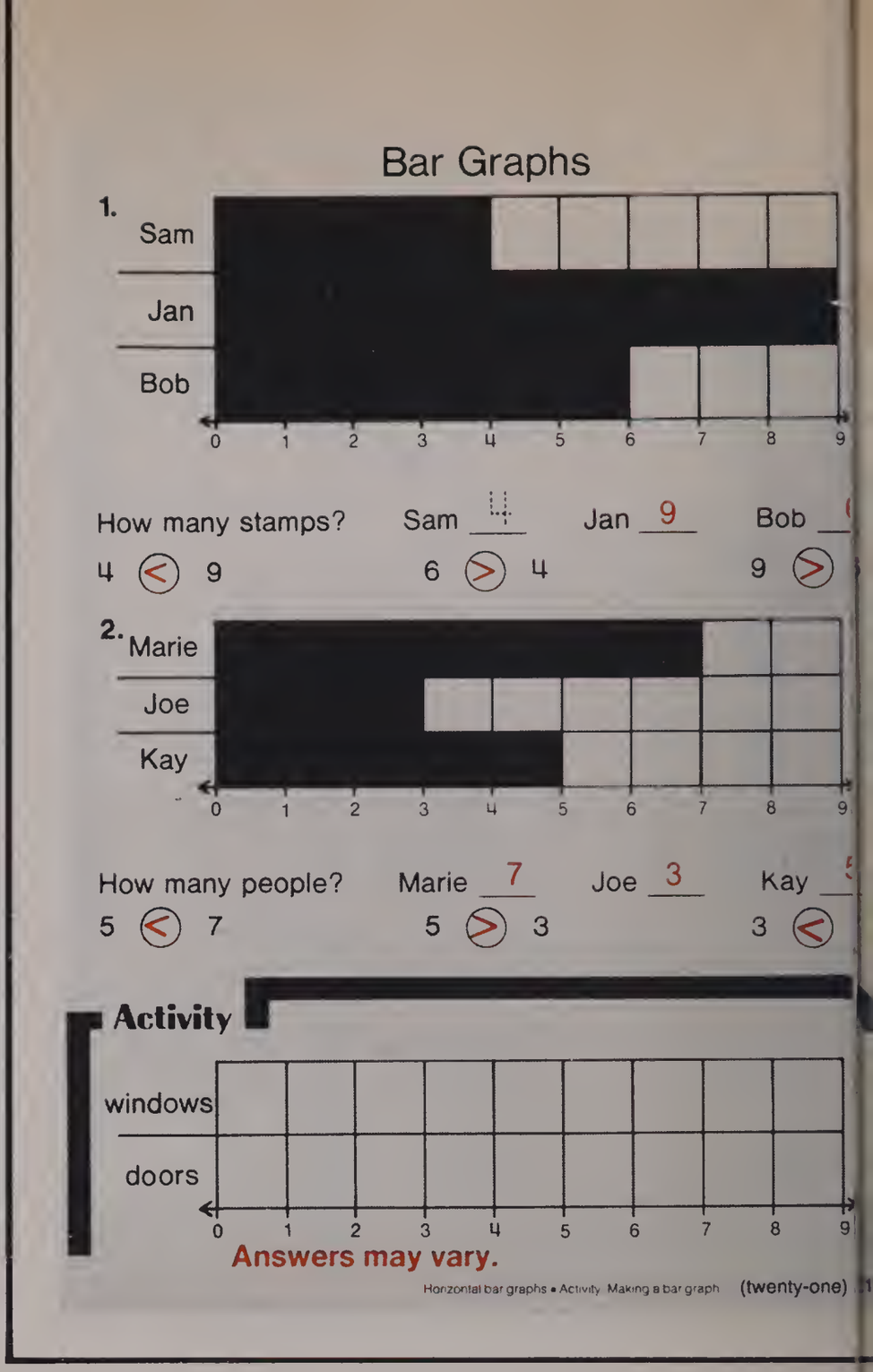
See Item 4 of the Chapter Overview Background.

SUGGESTIONS

Initial Activities 1. For page 21, review horizontal picture graphs using the graph constructed for Initial Activity, page 19.

Then prepare a grid like those in Panels 1, 2, or 3 on page 21. Guide the child in making the horizontal bar graph for the information given in the picture graph constructed for Initial Activity, page 19.

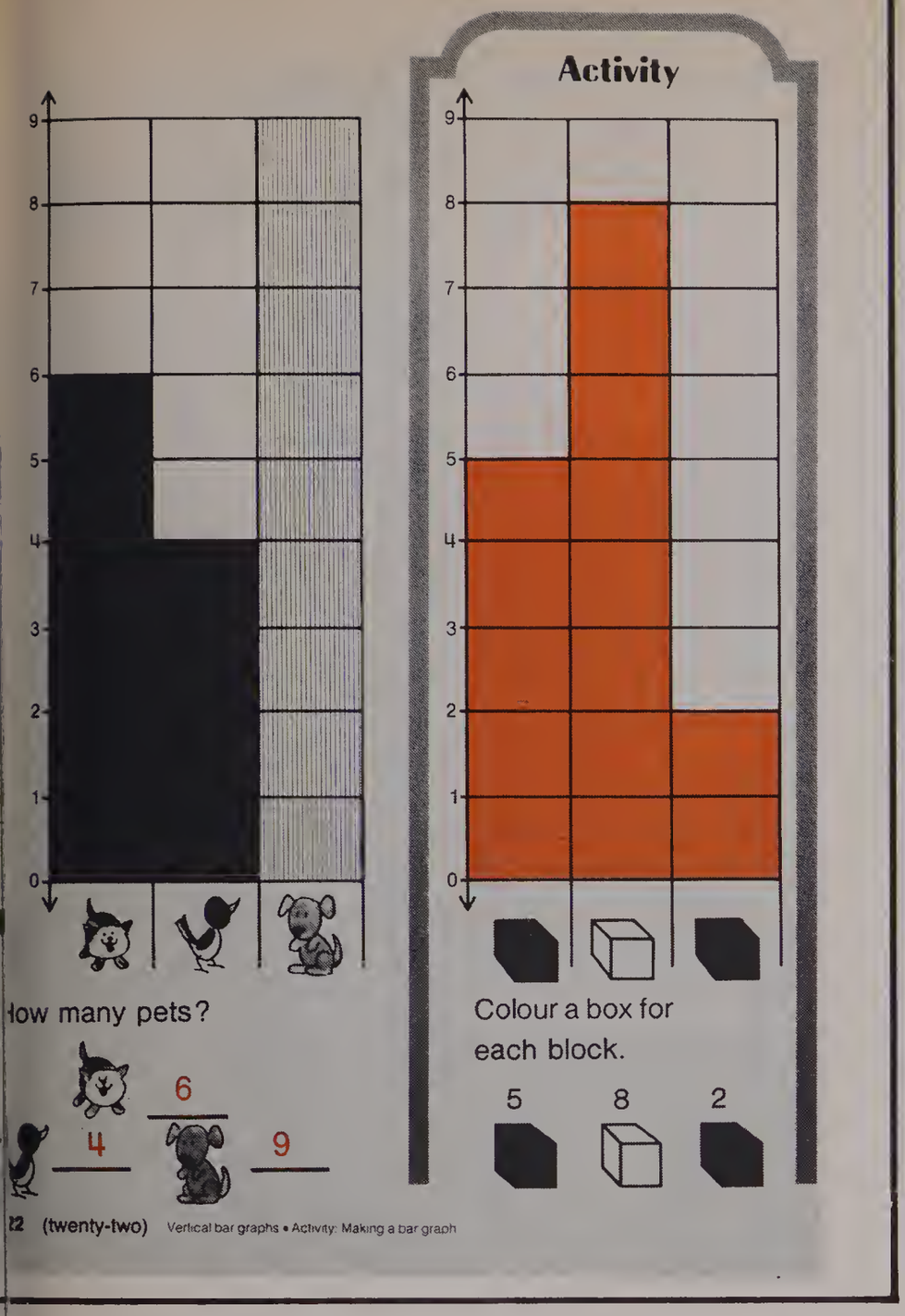
Call attention to the number line at the bottom of the bar graph. By looking at the number line, the number of frames in each row may be found without counting. Guide the child in coloring the correct number of frames.



Using the Book Panel 1: Tell the child that Sam, Jan, and Bob collect stamps. The graphs show how many stamps each has. Read the sentence, "How many stamps?" Have the child write the number of stamps each has. Tell the child to use the number line at the bottom of the graph to find the number of stamps each has. Then have the child write > or < in each of the rings to make a true sentence. Ask, "Who has the most? (Jan) Who has the least? (Sam)"

Panel 2: This graph shows how many people are in each family. Each colored box stands for a member of a family. Have the child write how many people are in each family. Then write > or < in each ring to make a true sentence.

Activity: In the first row the child colors one block red for each window in the classroom. In the next row, color one block green for each door in the classroom.



Using the Book Left panel: Explain that the vertical graph shows the number of pets in the pet shop. Ask, "What pets are shown in the graph? (cats, birds, dogs) The pet shop has the most of which one of the pets? (dogs) Does the pet shop have more birds than cats? (no) Are there more cats than birds? (yes)" Have the child count along the vertical number line on the left to find the number of each kind of pet.

Activity: Tell a story. "Ann built a block house. She used green, yellow, and blue blocks. The numerals at the bottom of the panel tell how many blocks of each color she used." Ask, "How many green blocks did she use? (5) How many yellow blocks? (8) How many blue blocks? (2)" Then have the child make a graph to show the number of colored blocks used. Say, "In the first column color one box for each green block used. In the second column, color one box for each yellow block used. In the last column color one box for each blue block used."

2. For page 22, review vertical picture graphs, using the graph constructed for the Initial Activity on page 20.

Then prepare a grid for a vertical graph similar to the one in Panels 1 or 2, page 22. Guide the child in drawing the graph, using the same information as that in the picture graph above.

Discuss the number line to the left of the graph and have the child answer questions about the information presented in the graph.

ACTIVITIES

1. Ask the child to try to find graphs, cut them out, and bring to class for displaying on the worktable or around the room.

2. Provide the child with three different color blocks (*i.e.*, 9 yellow, 5 purple, 3 red). Have the child stack three columns of blocks (each column same color of blocks) to construct vertical bar graphs. Have the child answer the question "How many" for each column of blocks.

3. Provide the child with a grid similar to the one at the bottom of page 21. Have the child select a horizontal picture graph from the worktable and make a horizontal bar graph that shows the given information.

4. Provide the child with blocks and crayons of 3 different colors and a grid similar to the one on the right of page 22. Have the child stack 3 columns of blocks (each column same color) and then use the grid to construct a vertical bar graph to show the number of blocks of each color.

5. Have a group of children look around the school ground for trash such as soda cans, candy wrappers, paper, etc., and list the number of each article found. Then have the child prepare a bar graph of the information. You may wish to title the graph, "Clean Up The School Ground."

OBJECTIVE

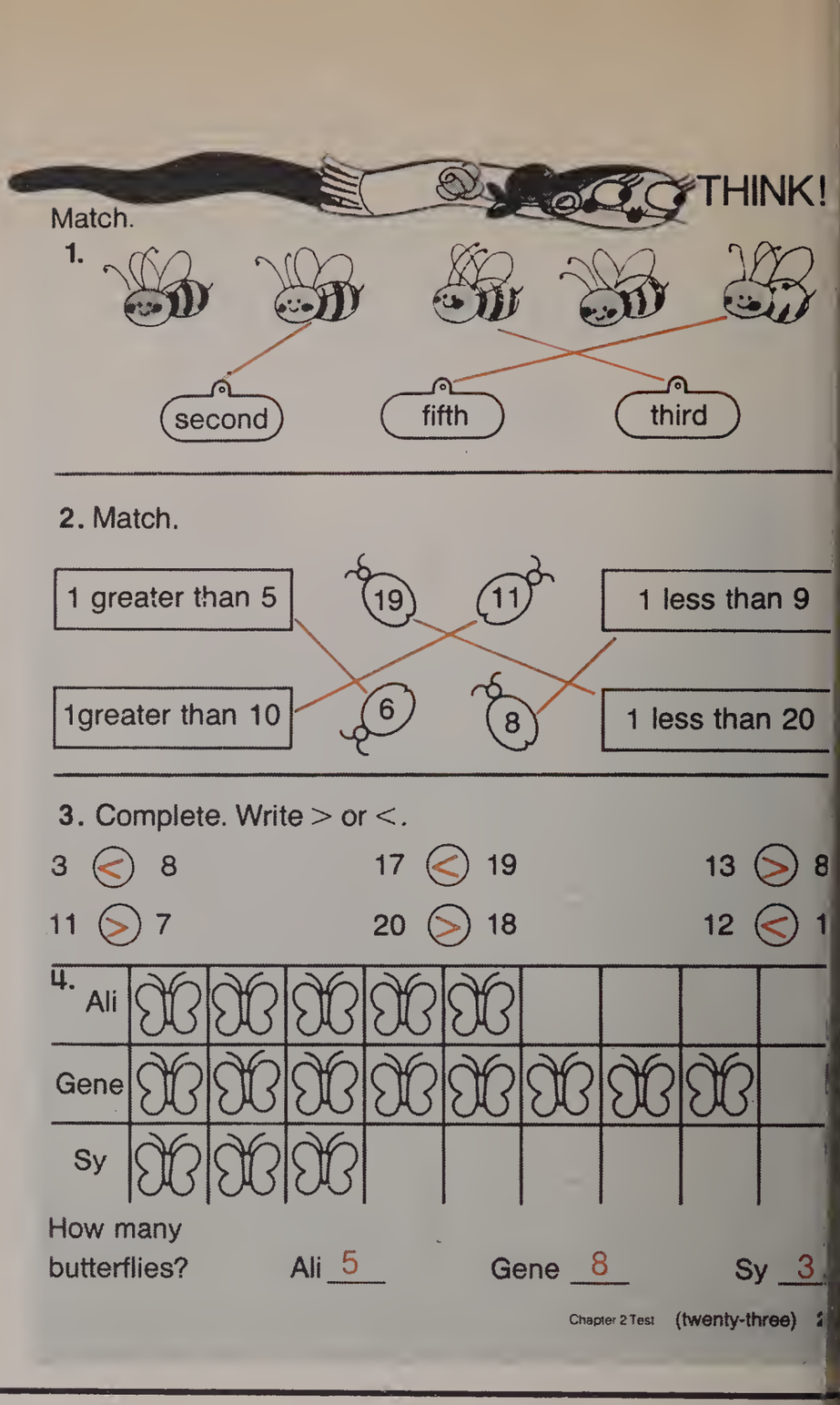
To evaluate achievement of the Chapter Objectives

PACING

Level A	23 All
	24 All
Level B	23 All
	24 All
Level C	23 All
	24 All

SUGGESTIONS

The Chapter Test is designed to be used in a diagnostic manner. It assesses the child's knowledge of the main concepts and skills that were taught in this Chapter. Some children should take this test independently with guidance for instructions only. Use judgment as to whether certain children should be guided through some or all of the exercises. Check each child's work and mark the items that are incorrect. Reteaching or extra practice might be necessary to help the child acquire the concept or skill that was missed. With this reteaching, you will be able to ascertain whether the child has then learned the topic in question. See Using the Book for page references indicating where the concept or skill was taught.



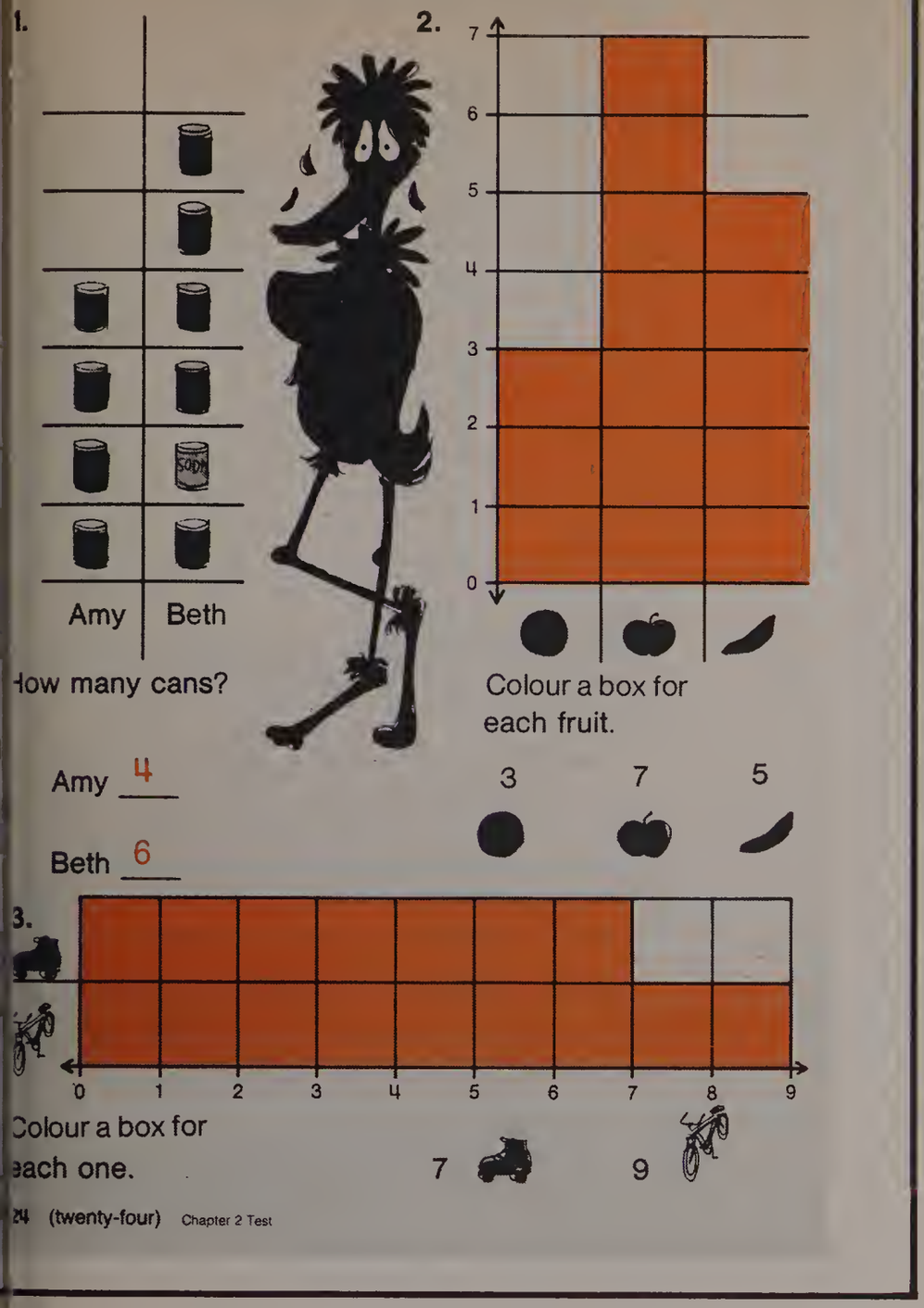
Using the Book This is a diagnostic test. The page references are given for reteaching as needed. The letter indicates the objective.

Panel 1: Have the child count the bees from left to right. Then read the words and match each word with the bee in that place. [page 17 C]

Panel 2: Have the child match the phrase in each box with the number of the bug that the phrase describes. [pages 12, 14 B]

Panel 3: Have the child write > or < in each circle to make each sentence true. [pages 15–16 A]

Panel 4: Explain that Ali, Gene, and Sy went out to catch butterflies. By counting the butterflies in the graph, the child can find how many butterflies each caught. Answers are to be written in the blanks next to each name. [page 19 D]



Using the Book This is a diagnostic test. The page references are given for reteaching as needed. The letter indicates the objective.

Panel 1: Say, "The graph shows how many sodas each girl drank last week. Fill in the blanks below the graph to show how many cans of soda each girl drank." [page 20 D]

Panel 2: Say, "Ms. Mars put out some fruit. The numerals below the graph tell how many of each. How many oranges did she use? (3) How many apples? (7) How many bananas?" (5) Make a (vertical) bar graph showing the number of pieces of each fruit. Color a box for 1 of each fruit. [page 22 E]

Panel 3: Say, "Bobby saw some roller skates and bicycles on the playground." (See the roller skates and bicycles at the bottom of the page.) Ask, "How many roller skates did he see? (7) How many bicycles? (9)" Have the child make a (horizontal) bar graph showing the number of each that Bobby saw. [page 21 E]

ACTIVITIES

You may wish to work with the entire class for this activity. Arrange two teams with ten members each. Each team selects a leader, then the other nine children line up facing right or left. Then the leaders take turns giving the other team commands, such as "the eighth child, raise your left hand, the second child, raise your right foot," and so on.

The leader continues until a member of the opposing team makes an error. Then the other leader gives commands to the opposite team. Each team gets one point for each correct response.

Vary this activity with other concepts.

CHAPTER 3 OVERVIEW

Addition and subtraction, sums 7 or less are covered in this chapter. Addition and subtraction families also covered. The theme for this chapter is "The Circus."

OBJECTIVES

A To add, sums 7 and less
B To subtract from numbers 7 or less
C To recognize that changing the order of the addends does not change the sum
D To complete addition and subtraction families
E To choose a number sentence that goes with a pictured problem

VOCABULARY

add 25
plus 25
addend 25
sum 25
addition sentence 27
order of addends 29
subtract 31
minus 31
subtraction sentence 31
difference 31
addition and subtraction families 38

BACKGROUND

1. The concept of addition is developed in physical situations in which two disjoint sets are joined.

The order property of addition is used. That is, changing the order of the addends does not change the sum. This property is also known as the Commutative Property of Addition. It reduces the number of addition facts to be learned. For example, since $4 + 2 = 6$ then $2 + 4 = 6$.

2. The concept of subtraction is developed in physical situations in which a part of a given set is taken away from the set. Subtraction undoes addition. If we add 2 to 3 and then subtract 2 from the sum, we get 3. In other words, $(3 + 2) - 2 = 3$. When children know $3 + 2 = 5$, they should know $5 - 2 = 3$. The last two sentences are related addition and subtraction sentences. A broader interpretation may include $3 + 2 = 5$ and $5 - 3 = 2$ as related addition and subtraction sentences.

When we combine all the related addition and subtraction sentences using the same 3 numbers we call it a family. For example:

$3 + 2 = 5$ $\quad$ $5 - 2 = 3$
$2 + 3 = 5$ $\quad$ $5 - 3 = 2$

In some cases there are only two sentences in an addition and subtraction family. That is, when the two addends are the same. For example:

$3 + 3 = 6$ $\quad$ $6 - 3 = 3$

3. Addition can be associated with joining two sets of steps along a number line. Thus, $5 + 3 = 8$.

The first addend, 5 is shown by the first 5 steps to the right. The second addend 3, is shown by 3 more steps to the right. This is 8 units in all (0 to 8). The final arrow shows the sum 8.

Subtraction can be associated with a number line in which the number being subtracted is shown by steps going to the left. Thus, $8 - 3 = 5$.

The number in all, as 8, is shown first by steps to the right. The number subtracted, 3, is shown by steps to the left. The final arrow to the left points to the difference, 5. Thus, 5 units (0 to 5) remain.

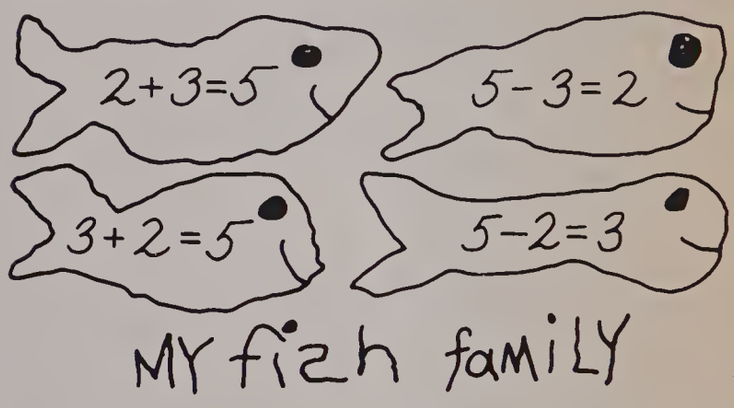
MATERIALS

colored blocks
2 clear plastic cups
domino cards (See Activity Reservoir.)
number line
colored chalk
non-transparent box
addition and subtraction practice cards
(See Activity Reservoir.)
pictured problems for addition and subtraction

BULLETIN BOARD

1. The children will enjoy a bulletin board with their own art as the focus. Have the children choose an addition or subtraction sentence and create a picture to illustrate it. Allow the child to choose his or her own medium: tempera paint, finger paint, crayon, or materials from the art scrap box pasted on paper. Each child should write the number sentence that goes with the illustration at the bottom of his or her picture.

2. The children might have fun showing a "family" of related addition and subtraction sentences. Let each child choose an animal for the "family." Provide a large duplicated outline of an animal or supply an oak tag template to be traced around. Some children may wish to draw their animals freehand. On each animal, the child writes a number sentence. (You may wish to supply number sentences already written.) After coloring the animals, the child pins them to the bulletin board.



3. The art in this chapter reflects things found in a circus. Children may enjoy creating a bulletin board for this theme. Have them cut pictures from newspapers and magazines.

OBJECTIVE

To add using vertical form, sums 7 or less

PACING

Level A	25	All (1-4 guided)
Level B	25	All (1-2 guided)
Level C	25	All (1 guided)

VOCABULARY

add, plus, addend, sum

MATERIALS

5 objects

SUGGESTIONS

Initial Activity Show 3 objects. Show 2 more objects below. Have the child tell the number in each set and the number in all. Show the vertical form.

$$\begin{array}{r} 3 \\ +2 \\ \hline \end{array}$$

Have the child relate each number to the appropriate set and give the sum.

ACTIVITIES

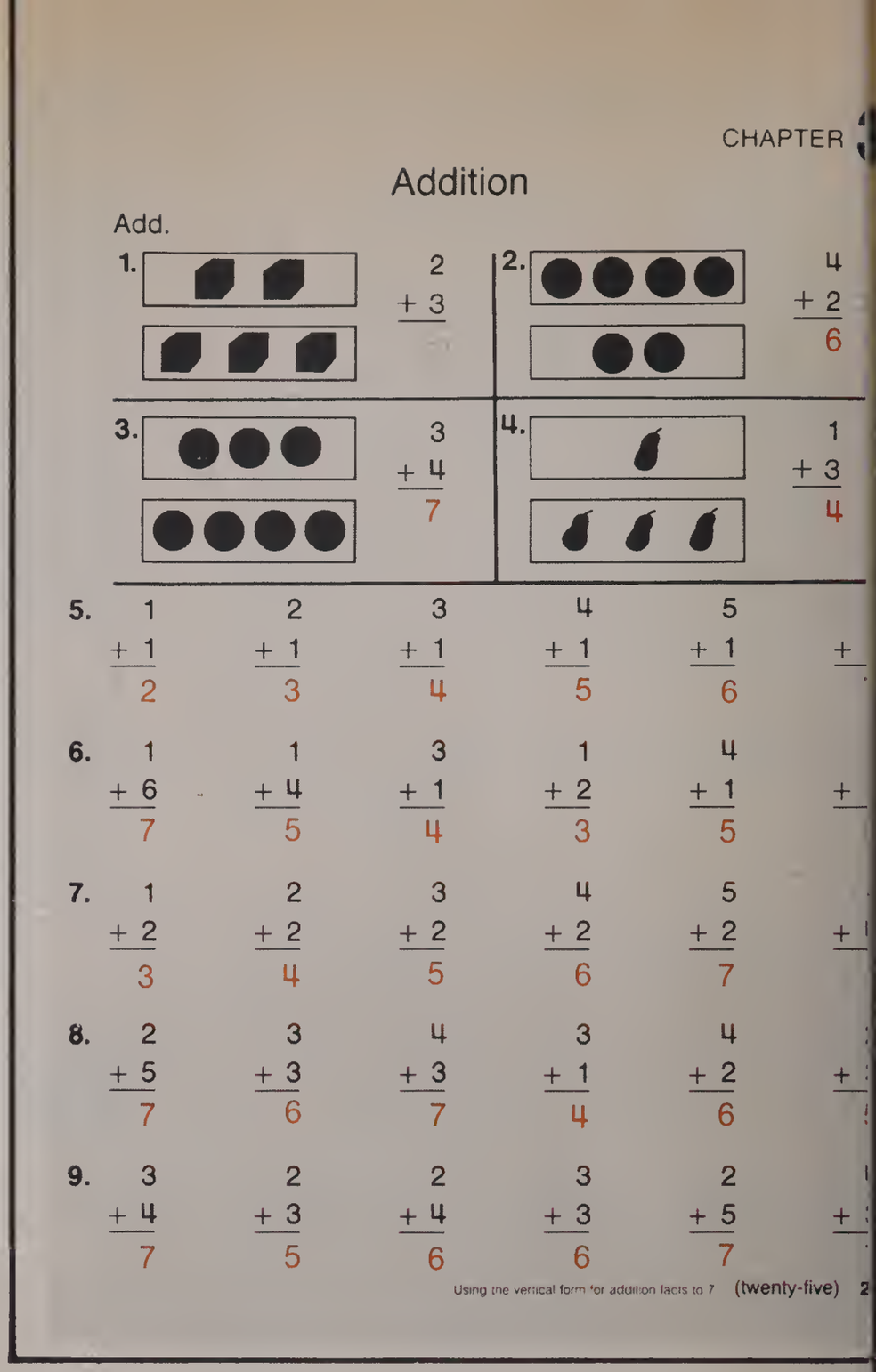
1. Give the child 7 blocks and the vertical addition practice cards, sums 7 and less. For each addition card, have the child show the appropriate number of blocks on each addend, then give the sum.

2. Give the child pairs of set cards so that there are less than 8 dots in all. For each pair, have the child tell the number of each set, the number of dots in all, and write the vertical addition that goes with joining the pair of sets.

3. Challenge the child with oral problems such as: "3 cars are in the garage and 1 is outside. How many cars in all?" The child writes the vertical addition for the problem.

RELATED AIDS

ACT. MASTERS—Seasonal 1, 2.
—Gen. Use 7-9, 13.



Using the Book Panel 1: Ask the child, "How many red blocks are there? (2) How many green blocks are there? (3)" Then ask, "How many blocks are there in all?" Tell the child, "Now we show the addition in a column." Have the child pair each addend with the appropriate set of blocks. Then have the child trace the sum, 5.

Panels 2–4: For each panel, have the child draw a mark from each addend to the set it goes with and then write the sum.

Panels 5–9: Tell the child to add.

d.

3 + 2 = 5	2 + 1 = 3	4 + 3 = 7	2 + 5 = 7	2 + 2 = 4	1 + 4 = 5
3 + 3 = 6	3 + 1 = 4	2 + 4 = 6	1 + 1 = 2	6 + 1 = 7	
2 + 3 = 5	5 + 2 = 7	1 + 1 = 2	1 + 3 = 4	1 + 6 = 7	3 + 3 = 6
5 + 1 = 6	2 + 2 = 4	3 + 4 = 7		4 + 1 = 5	3 + 2 = 5
2 + 5 = 7	1 + 6 = 7	1 + 1 = 2	3 + 1 = 4	4 + 2 = 6	3 + 3 = 6
1 + 2 = 3	4 + 2 = 6	1 + 5 = 6	2 + 2 = 4	4 + 1 = 5	3 + 4 = 7
1 + 1 = 2	2 + 4 = 6	3 + 3 = 6	2 + 1 = 3	2 + 2 = 4	5 + 1 = 6
1 + 4 = 5	3 + 2 = 5	2 + 5 = 7	6 + 1 = 7	1 + 3 = 4	4 + 3 = 7

AT HOME: Read some of these exercises and have the child tell you the answers. Say, "What is 3 plus 2?" and so on.

26 Practice, addition facts to 7

Using the Book Panels 1-8: For each panel have the child add.
At Home Upon completion of the pupil page, the child may take the page home and do the At Home.

OBJECTIVE

To add using vertical form, sums 7 or less

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

If children have unusual difficulty with these exercises, you could provide appropriate remedial work. Using blocks, have the child demonstrate the given addition and then write the answer. For example, pose the question "1 plus 2 equals what number?" Ask the child to show sets of 1 and 2 blocks. By joining the sets, the child can count the total number of blocks.

ACTIVITIES

1. Let those children having difficulty work in pairs or small groups with basic fact practice cards and concrete objects, if necessary, for finding sums 7 or less.

2. Adapt the game, Stop the Magician, described in the Activity Reservoir. Use addition sums of 7 or less.

3. Use the Basic Fact Practice Cards game described in the Activity Reservoir for sums of 7 or less.

RELATED AIDS

ACT. MASTERS—Seasonal 1, 2.
—Gen. Use 7-9, 13.

OBJECTIVE

To know that when 0 is one addend, the sum is the other addend

PACING

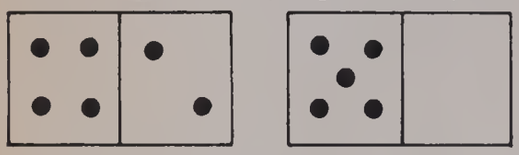
Level A	27 All (guided)
	28 All
Level B	27 All (1-3 guided)
	28 All
Level C	27 All (1-3 guided)
	28 All

VOCABULARY

addition sentence

MATERIALS

two clear plastic cups, five blocks, domino cards through sum 7 (samples shown)



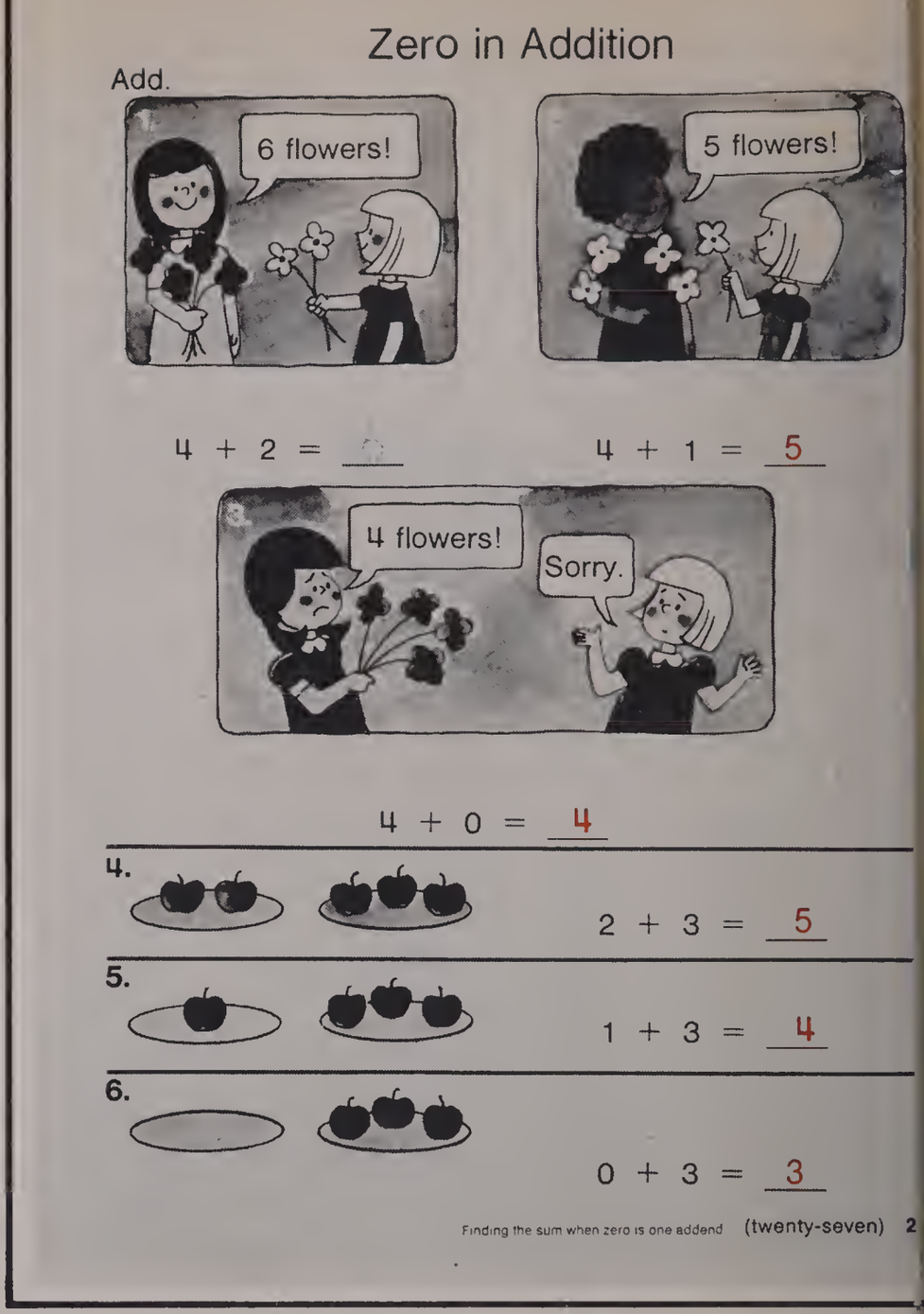
SUGGESTIONS

Initial Activities 1. Give the child 2 clear plastic cups with 3 blocks in the first cup and 2 blocks in the second cup. Have the child remove 1 block at a time from the second cup until it is empty. Along with this activity, establish and write these sentences.

$$3 + 2 = 5$$
$$3 + 1 = 4$$
$$3 + 0 = 3$$

Change the order of the sets above, writing sentences that go with them. Ask, "When 0 is one addend and 3 is the other addend, what is the sum? (3)"

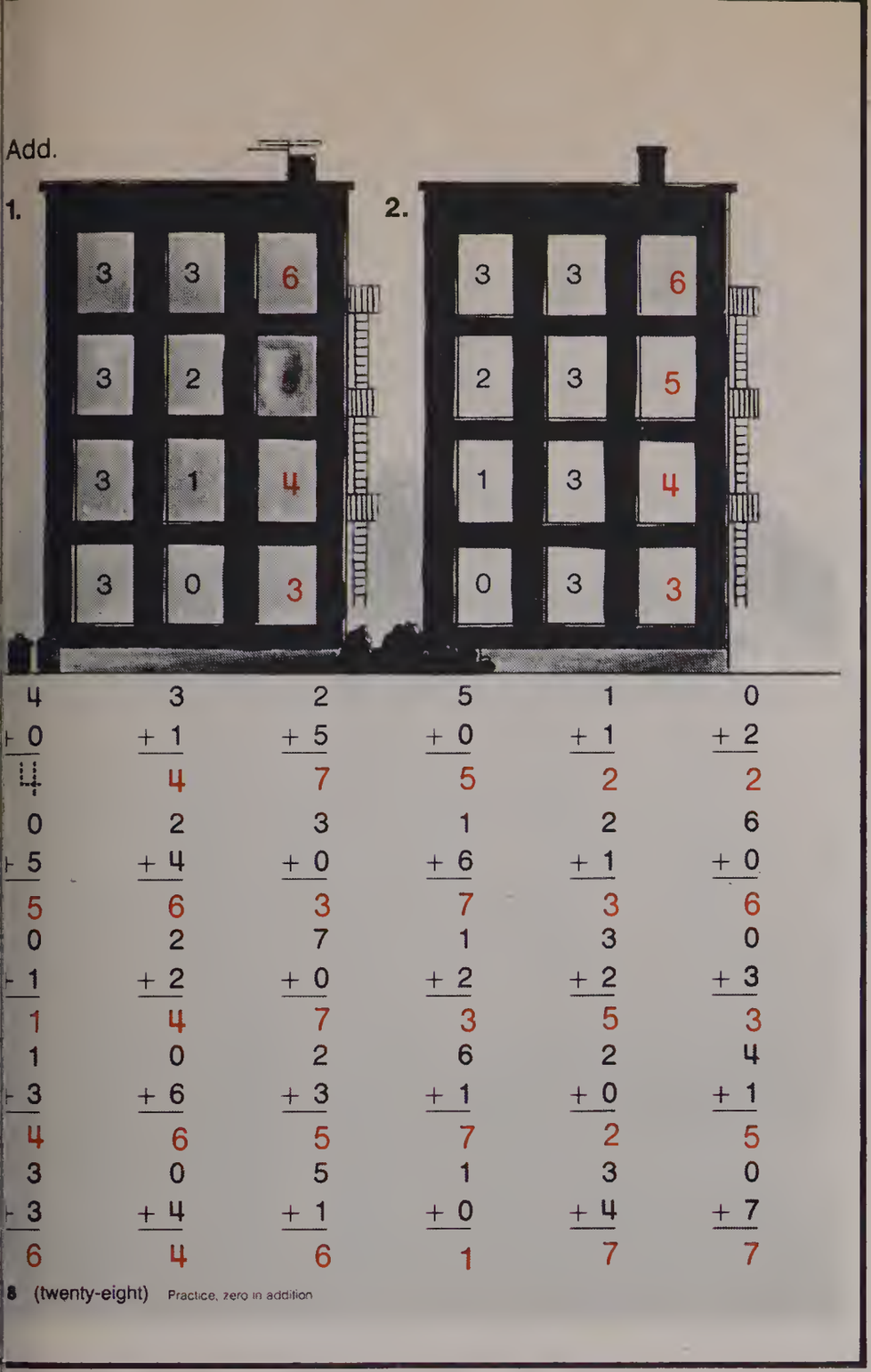
2. Give the child the domino cards through sum 7 (with one blank per card). Establish that the number of the blank part of a card is 0. For each card have the child give the number of each set, the sum, and then write the addition sentence. After some sentences such as 1 + 0 = 1, 0 + 4 = 4, and 2 + 0 = 2 have been written, ask, "When zero is one addend, what is the sum?"



Using the Book Panel 1: Ask, "How many flowers does the brown-haired girl have? (4) How many flowers is the yellow-haired girl giving her? (2)" Then, "How many flowers will the brown-haired girl have in all? (6) Four plus 2 is equal to what number? (6)" The child then completes the sentence below the picture.

Panels 2-3: For each panel, ask questions similar to those for panel 1. Then have the child complete the sentence below the picture. For panel 3, elicit that the yellow-haired girl has no flowers to give, that is, she has zero flowers to give.

Panels 4-6: Have the child write the sums. For panel 6, ask, "Zero plus 3 is equal to what number? (3)" Reinforce the idea by asking, "Zero plus 4 is equal to what number? (4) Two plus zero is equal to what number? (2)" You may have the child write each sentence.



Using the Book Panel 1: Have the child write the sum for each sentence. Have the child point to the first addend of each sentence in succession. Ask, "What is the first addend in each sentence? (3)" Have the child point to the second addend in each sentence. Elicit that each is 1 less than the addend in the previous sentence. Then have the child point to each sum. Ask, "How does the sum change in each sentence? (Each is 1 less than the previous sum.)"

Panel 2: Have the child write the sums. Discuss the pattern in a manner similar to that used in panel 1.

Panels 3-7: Have the child write the sums. Ask, "When zero is one addend, what do you know about the sum? (It is equal to the other addend.)"

ACTIVITIES

1. The child might enjoy the computer game. For 3 min a day, let the child pretend to be a computer or mini-calculator. The child is to give the sums as quickly as possible when you call out examples, like "1 + 2, 1 + 1."

2. You may wish to group several children for this activity. Form teams with 2 children on each team. Each team writes all the addition sentences they can with sum 7. They get one point for each correct sentence. Continue playing the game using sums 5, 4, 3, 2, 1, and 0.

3. Challenge the child to write all combinations for sums 8 and 9.

RELATED AIDS

ACT. MASTERS—Seasonal 1, 2.
—Gen. Use 7-9, 13.

OBJECTIVE

To know that changing the order of the addends does not change the sum

PACING

Level A	29 All (1-2 guided)
	30 All
Level B	29 All (1-2 guided)
	30 All
Level C	29 All (1 guided)
	30 All

VOCABULARY

order of addends

MATERIALS

3 red blocks, 2 green blocks

BACKGROUND

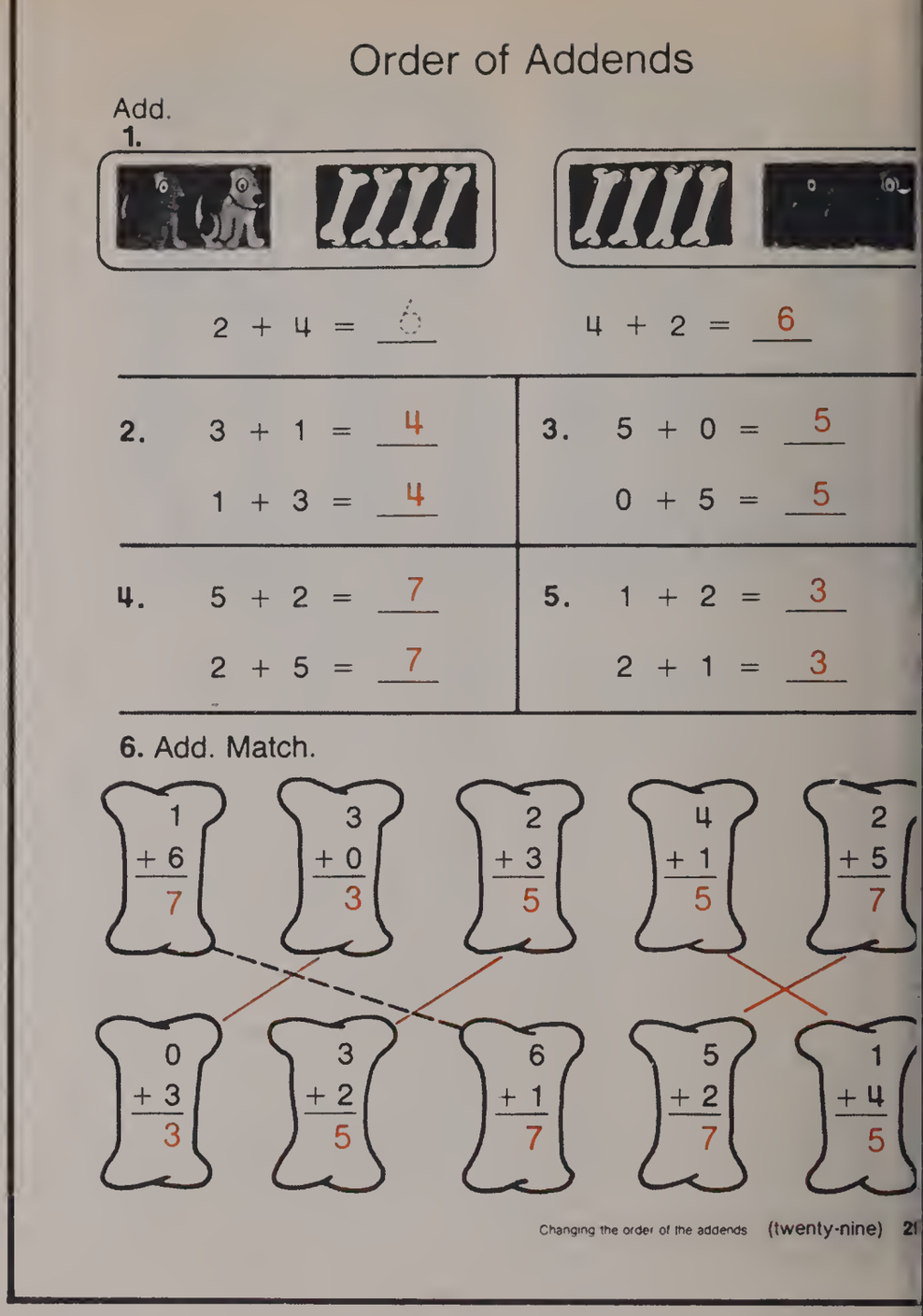
See Item 1 of the Chapter Overview Background.

SUGGESTIONS

Initial Activity Ask the child to show a set of 3 red blocks and a set of 2 green blocks. By joining the sets in one order and then the other, develop these addition sentences.

$$3 + 2 = 5$$
$$2 + 3 = 5$$

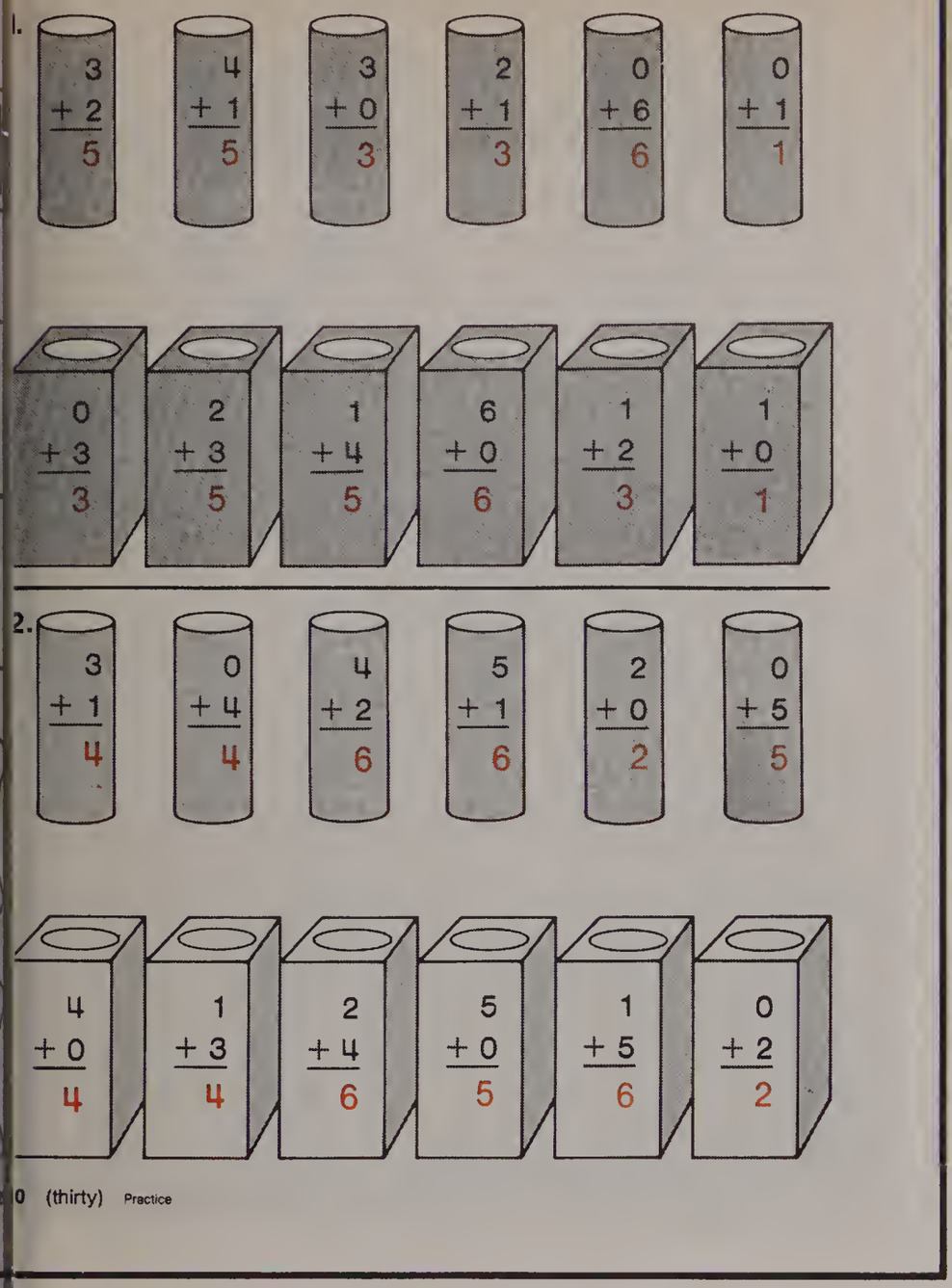
Ask the child to read each sentence and name the first addend, the second addend, and the sum. Then ask, "Did changing the order of the addends change the sum?" Explain, "These addition sentences show the order property of addition."



Using the Book Panel 1: Call attention to the set on the left. Ask, "How many dogs? (2)" The child may write 2 on the set. Ask, "How many bones? (4)" The child may write 4 on the set. "How many in all? (6) Two plus 4 is equal to what number? (6)" Then have the child trace 6 in the blank and read the sentence. Repeat this procedure for the set on the right. Then ask, "How is the sentence on the left different from the sentence on the right? (The addends are in a different order.) Did changing the order of the addends change the sum? (no)"

Panels 2-5: Tell the child to write the sums.

Panel 6: Have the child write the sums. Then the child pairs each addition in the top row with an addition in the bottom row that has the same addends in a different order. Ask, "Does changing the order of the addends change the sum? (no)"



Using the Book Panels 1-2: Have the child give the sums. Then have the child pair each addition in the top row with the addition in the bottom row that has the same addends but in a different order.

When the assignment is completed ask, "How can you tell which additions go together without first finding the sums? (By finding the additions with the same addends but in different order)."

ACTIVITIES

1. Give the child addition practice cards, such as 3 + 2 (or vertical addition practice cards) with sums 7 and less. Have the child pair those cards which show the order property of addition.

2. Involve two or more children in a card game of Matching. Provide index cards such as:

Addend cards			Sum cards
3 + 2	or	3 + 2	5

Each player is dealt 4 or more addend cards. Sum cards 0 through 7 may be shuffled and placed in a stack on the table. Each child takes a turn drawing a sum card. If it matches (i.e., 1 + 2 and 3), the child lays this pair on the table. If not, the card is discarded in another pile. If both children have unmatched cards after using all the cards in the sum pile, reshuffle the discard pile and have children continue playing until one child wins.

3. Extend the card game Matching, described above, by including sums beyond 7.

4. Have the child make a poster showing the order of doing things. Children can include other suggestions.

DOES IT MATTER?

YES	NO
1. Putting on the left sock and then the left shoe.	1. The order of adding two numbers.
2. Putting on underwear and then street clothes.	2. Putting on the left and the right shoe.
3. Watching TV then turning it on.	3. Brushing the teeth and washing the face.

RELATED AIDS

ACT. MASTERS—Seasonal 1, 2.
—Gen. Use 7-9, 13.

OBJECTIVE

To subtract from numbers 7 or less using the vertical form

PACING

Level A All (1 guided)
Level B All (1 guided)
Level C All

VOCABULARY

subtract, minus, subtraction sentence, difference

MATERIALS

subtraction practice cards, vertical form with subtracting from 7 or less

SUGGESTIONS

Initial Activities 1. Draw 6 pictures of birds on the chalkboard. Tell a story: "6 birds were on the fence. 2 of them flew away." (Mark X on 2 birds to show those that flew away.) Ask, "How many are left?" Have the child give the subtraction sentence that goes with the story. (6 − 2 = 4) Say, "There is another way to show this subtraction." Then to the right of the pictures, write the vertical form.

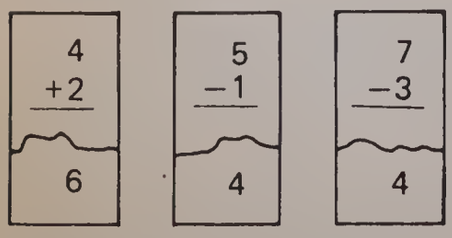
2. Show several vertical form subtraction practice cards, subtracting from 7 or less. Have the child give the differences.

ACTIVITIES

1. Have the child use vertical form subtraction practice cards, subtracting from 7 or less.

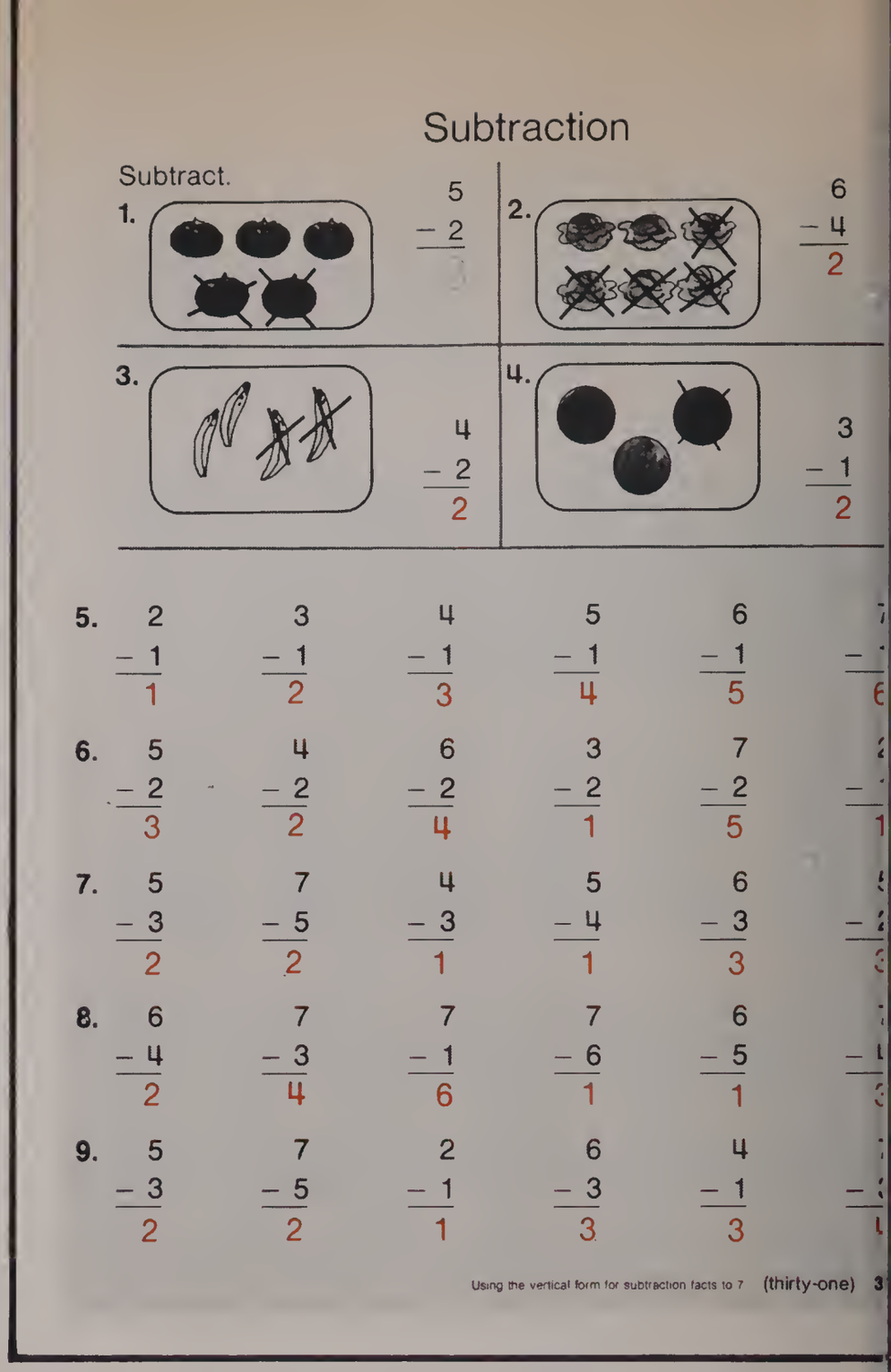
2. Using subtraction, adapt the card game of Matching described on page 30.

3. Prepare jigsaw puzzle subtraction cards (each with a different cut). Let children see who can fit the cards together first.



RELATED AIDS

ACT. MASTERS—Seasonal 3, 4.
—Gen. Use 10, 11, 13.



Using the Book Panel 1: Tell a story. "Donna had five tomatoes. She used two of them when cooking lunch. How many tomatoes does she have left? (3)" Ask, "What does the X mean on each tomato? (taken away or cooked)" Call attention to the vertical form of subtraction. Then ask, "5 minus 2 is equal to what number?" Have the child trace 3 below the bar.

Panels 2-4: Have the child look at the pictures and then write the differences.

Panels 5-9: Have the child write the differences. In this panel, there are no picture clues.

You may wish to ask the child to find all the exercises in which zero is subtracted. Ask, "When 0 is subtracted, what is the difference? (the same as the first number)"

btract.

5 − 4 = 1	7 − 3 = 4	3 − 2 = 1	6 − 5 = 1	4 − 3 = 1	7 − 4 = 3
6 − 2 = 4	3 − 1 = 2	5 − 3 = 2	7 − 6 = 1	4 − 2 = 2	6 − 4 = 2
6 − 3 = 3	7 − 5 = 2	2 − 1 = 1	5 − 2 = 3	4 − 1 = 3	7 − 2 = 5
5 − 1 = 4	3 − 1 = 2	6 − 2 = 4	2 − 1 = 1	7 − 1 = 6	4 − 2 = 2
6 − 1 = 5	7 − 3 = 4	3 − 2 = 1		4 − 3 = 1	7 − 6 = 1
7 − 4 = 3	5 − 3 = 2	2 − 1 = 1	6 − 4 = 2	4 − 1 = 3	7 − 5 = 2
7 − 2 = 5	3 − 1 = 2	6 − 5 = 1	5 − 2 = 3	7 − 1 = 6	5 − 4 = 1
5 − 1 = 4	4 − 2 = 2	7 − 4 = 3	6 − 1 = 5	3 − 2 = 1	

AT HOME: Read some of these exercises and have the child tell you the answers. Say, "What is 5 minus 4?" and so on.

2 (thirty-two) Practice, subtraction facts to 7

OBJECTIVE

To subtract from numbers 7 or less using the vertical form

PACING

Level A	All
Level B	All
Level C	All

EXTRA PRACTICE

Tell the child to subtract.

1.	3 − 2 = 1	7 − 2 = 5	4 − 1 = 3	6 − 5 = 1	5 − 3 = 2
2.	2 − 1 = 1	6 − 4 = 2	4 − 3 = 1	7 − 1 = 6	6 − 3 = 3
3.	7 − 5 = 2	4 − 2 = 2	5 − 1 = 4	3 − 1 = 2	6 − 2 = 4
4.	5 − 2 = 3	6 − 1 = 5	7 − 3 = 4	5 − 4 = 1	7 − 4 = 3
5.	4 − 3 = 1	7 − 6 = 1	4 − 2 = 2	6 − 3 = 3	5 − 1 = 4
6.	3 − 2 = 1	7 − 1 = 6	6 − 2 = 4	7 − 5 = 2	4 − 1 = 3

RELATED AIDS

ACT. MASTERS—Seasonal 3, 4.
—Gen. Use 10, 11, 13.

OBJECTIVES

To know that when a number is subtracted from itself, the difference is 0

To know that when 0 is subtracted from a number the difference is the number

PACING

Level A	33	All (guided)
	34	All
Level B	33	All (1-3 guided)
	34	All
Level C	33	All (1-3 guided)
	34	All

MATERIALS

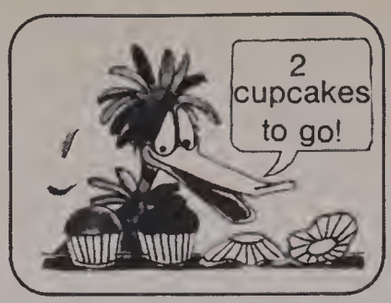
9 blocks

SUGGESTIONS

Initial Activity Ask the child to show three sets of blocks (red, green, and yellow) each with 3 blocks. Have the child take 1 block from the first set, 2 blocks from the second, and 3 blocks from the third. Each time, have the child write the subtraction sentence for the situation. Ask, "When zero is subtracted from three, what is the difference? (3)"

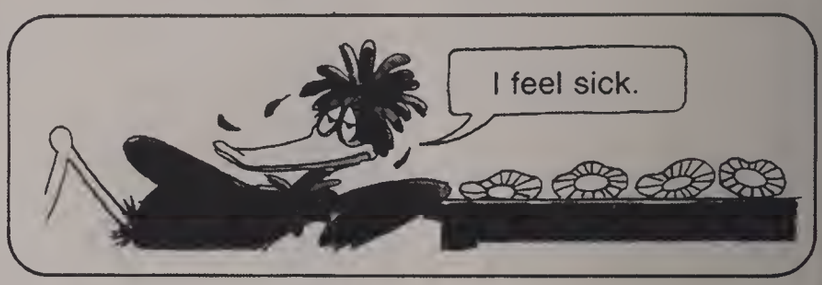
Zero in Subtraction

Subtract.

1. 

2.

4 − 2 = 2 4 − 3 = 1

3. 

4 − 4 = 0

4. 5 − 2 = 3

5. 5 − 1 = 4

6. 5 − 0 = 5

Using the Book Panel 1: "How many cupcakes do you think there were in all before Plat Flat ate some? (4) How many cupcakes did he eat? (2) How many cupcakes are left? (2) Four minus 2 is equal to what number? (2)" Trace the 2. Ask the child to read the sentence and tell the difference.

Panels 2-3: Ask similar questions about each picture. Have the child complete the sentence in each panel. You may have the child read each sentenc and tell the difference. For panel 3, explain that there are no cupcakes left so the number of cupcakes left is zero.

Panels 4-6: Have the child complete the sentences. Tell the child that the X on a popsicle means the popsicle has been taken away or eaten. Ask question like those in panel 1.

6	7	3	2	6	5
− 0	− 4	− 3	− 1	− 5	− 5
6	3	0	1	1	0
1	7	7	6	4	3
− 0	− 6	− 0	− 3	− 4	− 0
1	1	7	3	0	3
4	5	2	7	6	5
− 3	− 0	− 2	− 1	− 6	− 2
1	5	0	6	0	3

sing the Book Panels 1–4: Tell the child to write the differences. After the ild has completed the assignment, call attention to panel 3: Have the child ad the last sentence. Ask, "If a number is subtracted from itself, what is the fference? (0) Five minus five is equal to what number (0)" Then call atten- on to panel 4. Ask the child to read the sentences. Ask, "If we subtract zero om a number, what is the difference? (that number)" Have the child point it the pattern in each panel.

Panels 5-7: Have the child give the differences.

ACTIVITIES

1. Write 5 − 3 = ___; 5 − 4 = ___; 5 − 5 = ___ in a column. Have the child find the differences. Ask, "When 4 is subtracted from itself, what is the difference?"

2. Let the child dramatize the action in Panels 1-3. Have the child pretend to be Plat Flat. Give the child 4 marshmallows in place of cupcakes. Have the child eat 2 and then write the equation 4 - 2 = ___. When the child gives the answer, have the child eat another. Ask, "Now how many have you eaten? (3)" Write 4 - 3 = ___ and have the child give the difference. Continue until the child has "devoured" all 4. The child can then pretend to have a tummyache just like Plat Flat. Ask the child "4 - 4 is equal to what number? (0)"

3. Write these sentences in a column:
4 - 4 = ___; 4 - 3 = ___; 4 - 2 = ___; 4 - 1 = ___; 4 - 0 = ___. Ask the child to find the differences. Then ask, "When 0 is subtracted from a number, what is the difference?"

4. The children might enjoy a group activity. Have them play a game called Deliver the Mail. Station 8 children about the room to represent houses. Each child holds a numeral card 0 through 7. Select two teams from the remaining children. Give each team a set of all the addition and subtraction practice cards with sums 7 and less. Tell each team to deliver their cards to the "houses." That is, each card is to be delivered to the house whose number shows the sum or difference on the card. The first team to deliver their cards correctly wins the game.

5. Write sentences such as 7 - 7 = ___; 9 - 0 = ___; 8 - 0 = ___; 9 - 9 = ___; Challenge the child to find the differences.

6. Play the game, Stop the Magician, described in the Activity Reservoir.

RELATED AIDS

ACT. MASTERS—Seasonal 3, 4.
—Gen. Use 10, 11, 13.

OBJECTIVE

To choose an addition sentence that goes with a pictured problem

PACING

Level A	All (1–2 guided)
Level B	All (1 guided)
Level C	All

MATERIALS

posters or pictures for addition

SUGGESTIONS

Initial Activity Select suitable pictures or posters from the worktable. Have the child make up stories about the pictures with which addition sentences may be associated. You may or may not have the child give the addition sentence for each story. The important thing is to make up stories about pictures.

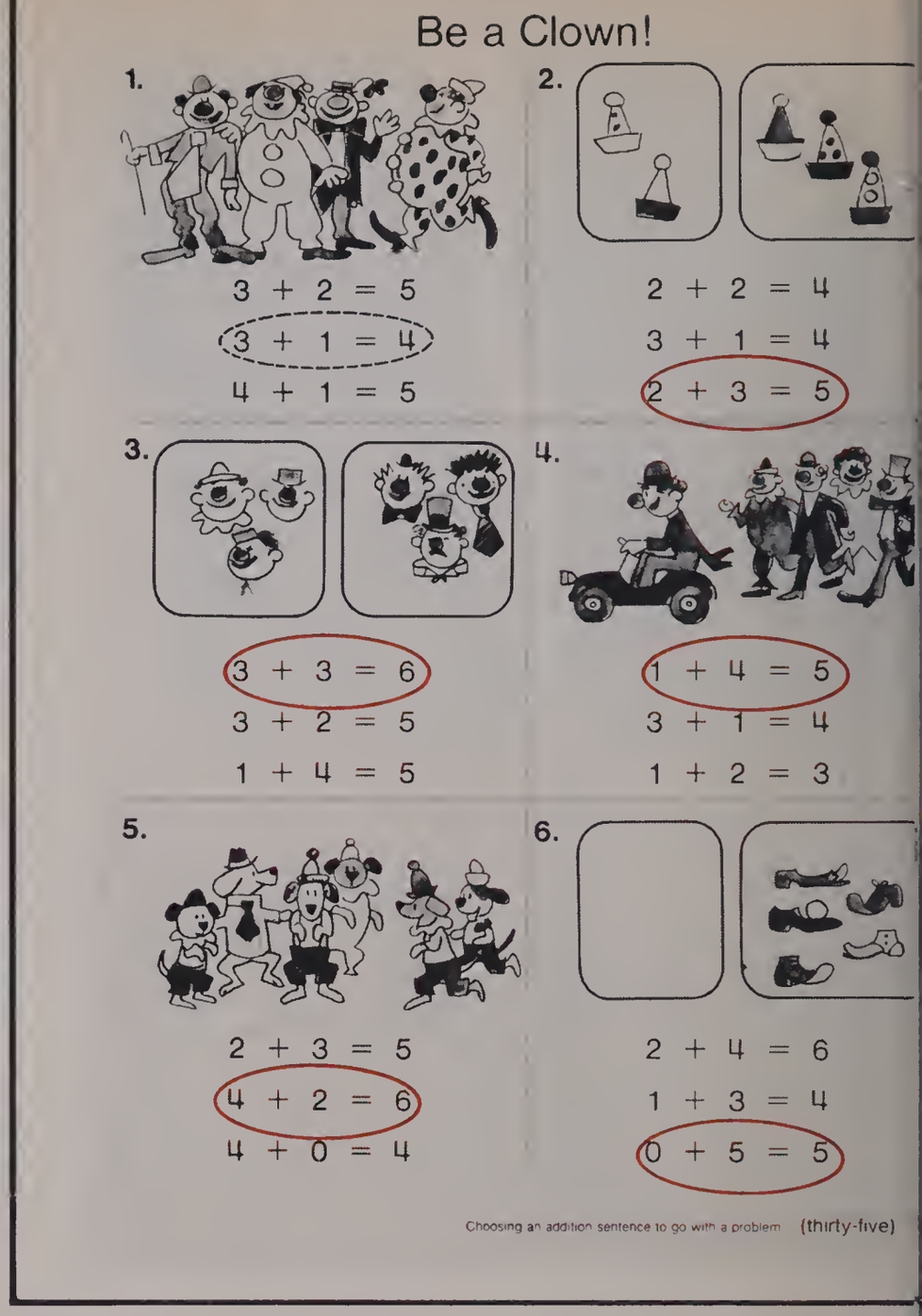
ACTIVITIES

1. Use Bulletin Board suggestion 3. Display around the room. Have children write the name of each picture and tell how many.

2. Use Bulletin Board suggestion 1. Have the child use addition sentences.

3. Give the child 7 blocks. Dictate stories and have the child dramatize them. For each story, write 3 sentences similar to those on page 39 so that one and only one of the sentences goes with the story. Then have the child identify that sentence.

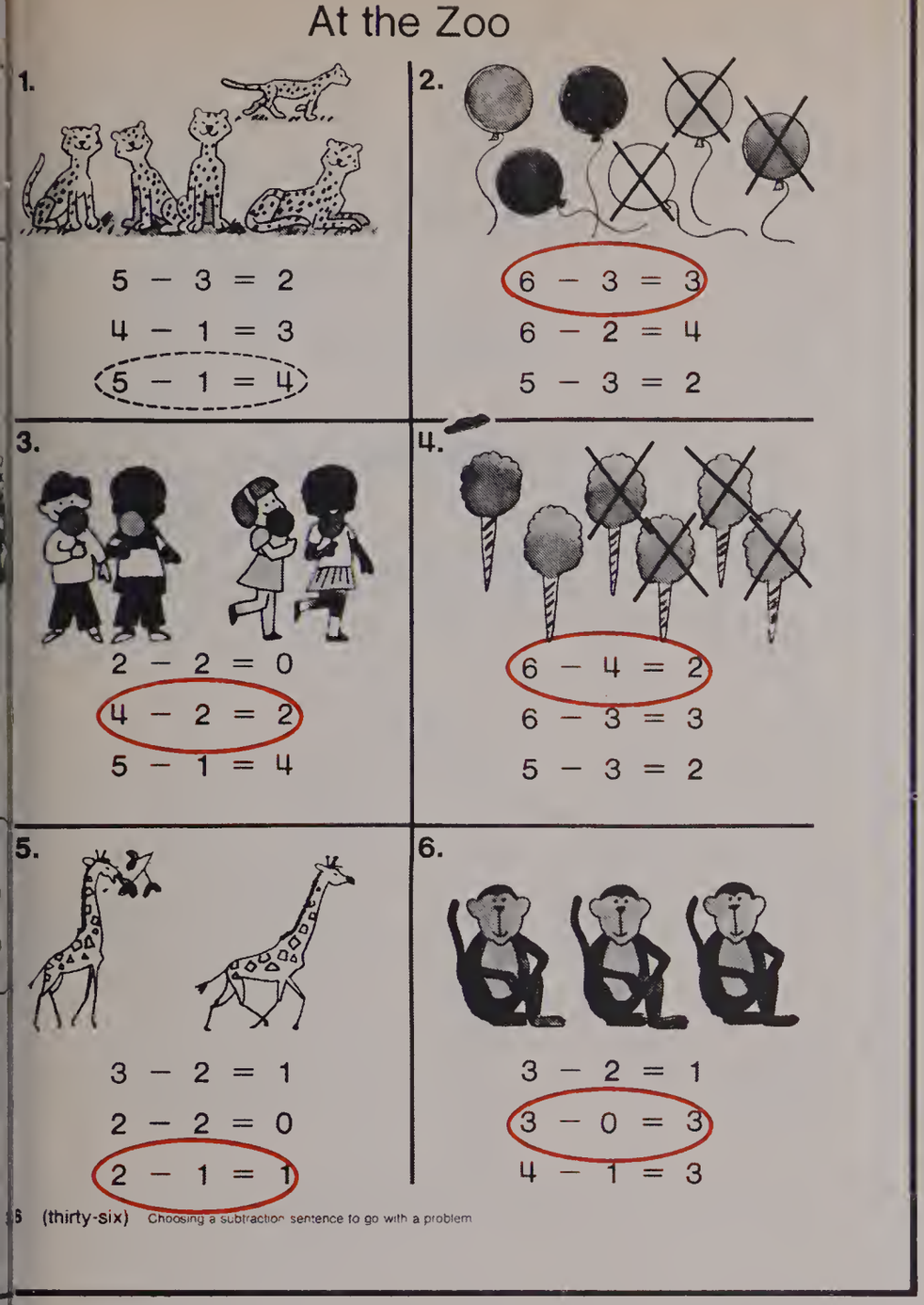
4. The child might enjoy a game called "I'm thinking of two numbers that make 6. One number is 2 more than the other. What are the numbers? (4, 2)"



Using the Book Panel 1: Tell a story. "Three clowns are doing an act. One more clown runs to join them." Ask, "3 clowns and 1 clown are how many clowns? (4) Which sentence should you ring?" Have the child trace over the dashed ring.

Panel 2: Tell a story. "Big Nose, the clown, has 2 hats in one box and 3 hats in another box. That makes 5 hats in all." Ask, "What sentence should you ring to go with the story?" Have the child draw a ring around 2 + 3 = 5.

Panels 3-6: Tell the child to think of a story that goes with each picture, then ring the sentence that goes with the story. You might select a panel, then ask the child to tell a story about the picture and read the sentence selected.



Using the Book Panel 1: Tell the child the pictures show things you may see or buy at the zoo. Direct attention to panel 1. Tell a story. "5 little leopards were playing together. One leopard got tired and is going away so 4 little leopards are left to play together." Ask, "5 leopards in all, 1 leopard goes away, so how many leopards are left? (4)" Ask, "Which sentence would you ring?" Have the child trace over the dashed ring.

Panel 2: Tell a story. "Jackie bought 6 balloons at the zoo. 3 of the balloons burst, so she had three balloons left." Ask, "What do the X's mean on 3 of the balloons? (burst) Which sentence should you ring?" Have the child ring 6 - 3 = 3.

Panels 3-6: Tell the child to think of a story that goes with each picture, then ring the sentence that goes with the story. You may discuss panel 6 briefly: There are three monkeys and no monkeys are going away.

OBJECTIVE

To choose a subtraction sentence that goes with a pictured problem

PACING

Level A	All (1-2 guided)
Level B	All (1 guided)
Level C	All

MATERIALS

pictured problems for subtraction

SUGGESTIONS

Initial Activity Provide the child with pictured problems with which subtraction may be associated. Have the child make up stories about the pictures. Have the child give a subtraction sentence for each story.

ACTIVITIES

1. Give the child 7 blocks. Write a subtraction sentence such as 7 - 3 = ___. Ask the child to use the blocks to tell and dramatize a story problem that goes with the subtraction sentence. Then the child finds the difference.

2. Involve the child in Bulletin Board 1 in the Chapter Overview. Use subtraction sentences.

3. Have the child add and subtract. Use addition and subtraction practice cards, sums 7 and less.

4. Use posters, tables, and large pictures to encourage the child in making up problems. It may be that some of the problems cannot be solved. The important thing is to encourage imagination and creativity.

5. Extend the activity by having the child cut and paste pictures to fit addition and subtraction sentences.

OBJECTIVE

To subtract from 7 and less

PACING

Level A	All
Level B	All
Level C	All

MATERIALS

Basic Fact Wheels
(See Activity Reservoir.)

SUGGESTIONS

Initial Activity Spin the Basic Fact Wheel. Have the child write the appropriate vertical subtraction. Repeat using several examples.

ACTIVITIES

1. Using blocks, have the child demonstrate a given subtraction. For example, pose the question "7 minus 2 equals what number?" The child shows 7 blocks. Then takes away 2 blocks. Point out that the 5 remaining blocks is the difference.

2. Adapt the game Concentration, as described in the Activity Reservoir, for subtraction facts to 7. Use only 6 cards.

3. The child might enjoy using a mini-calculator to verify some of the answers on page 37.

4. Adapt the Ladder game described in the Activity Reservoir. Use subtraction facts to sum 7.

EXTRA PRACTICE

Tell the child to subtract.

1.	5 − 4 = 1	7 − 3 = 4	6 − 2 = 4	4 − 4 = 0	3 − 1 = 2
2.	2 − 0 = 2	7 − 6 = 1	5 − 3 = 2	6 − 5 = 1	4 − 2 = 2

RELATED AIDS

ACT. MASTERS—Seasonal 3, 4.
—Gen. Use 10, 11, 13.

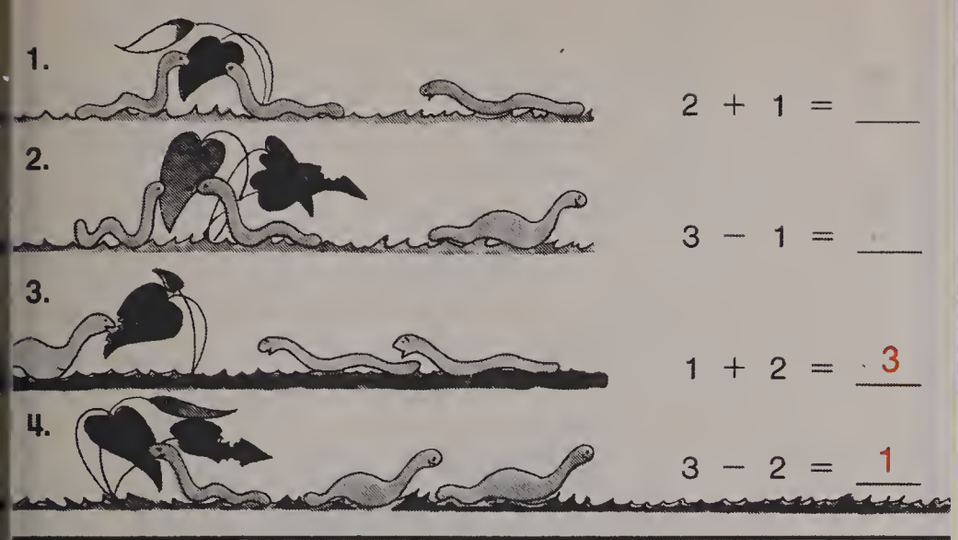
Extra Practice

Subtract.

1.	7 − 6 = 1	3 − 2 = 1	5 − 4 = 1	1 − 0 = 1	6 − 5 = 1	4 − 4 = 0
2.	6 − 1 = 5	5 − 3 = 2	7 − 3 = 4	4 − 0 = 4	2 − 2 = 0	5 − 2 = 3
3.	6 − 3 = 3	7 − 5 = 2	6 − 0 = 6	4 − 1 = 3	5 − 4 = 1	7 − 7 = 0
4.		5 − 1 = 4	6 − 5 = 1	7 − 2 = 5	2 − 1 = 1	6 − 4 = 2
5.	7 − 6 = 1	5 − 5 = 0	4 − 3 = 1	2 − 0 = 2	7 − 5 = 2	3 − 1 = 2
6.	7 − 1 = 6	6 − 2 = 4	3 − 0 = 3	6 − 6 = 0	5 − 3 = 2	4 − 1 = 3
7.	7 − 4 = 3	6 − 3 = 3	1 − 1 = 0	4 − 2 = 2	7 − 0 = 7	
8.	7 − 3 = 4	5 − 0 = 5	6 − 2 = 4	3 − 3 = 0	7 − 4 = 3	5 − 4 = 1

Extra Practice Subtraction facts to 7 (thirty-seven) 37

Using the Book Panels 1–8: Tell the child to subtract.



Using the Book Panels 1-4: Discuss the picture in each panel. For panels 1 and 3, you may ask, "How many worms are eating the leaf? How many worms are coming? How many worms are there in all?" For panels 2 and 4, you may ask, "How many worms are there in all? How many worms are going away? How many worms are left eating the leaf?" After the questions for each panel are answered, relate the sentence to the picture and have the child write the sum or difference.

Then ask the child to read the four sentences. Ask, "What numbers do you see in each sentence? (2, 1, and 3)" Tell the child that these four sentences make an addition and subtraction family because the same numbers are used in all the sentences.

Panels 5-7: Tell the child to give the sums and differences.

OBJECTIVE

To find sums and differences in addition and subtraction families

PACING

Level A	43 All (1-6 guided)
	44 All
Level B	43 All (1-5 guided)
	44 All
Level C	43 All (1-4 guided)
	44 All

VOCABULARY

addition and subtraction families

BACKGROUND

See Item 2 of the Unit Overview Background.

SUGGESTIONS

Initial Activities Write 2 + 3 = 5. Ask the child to give another addition sentence using 2 and 3 as addends but in a different order. Then have the child give a related subtraction sentence for each addition sentence. The four sentences may be written on the chalkboard:

2 + 3 = 5	5 − 3 = 2
3 + 2 = 5	5 − 2 = 3

Lead the child to discover that:

a. The only numbers in each sentence are 2, 3, and 5. Ask, "What numbers are in each sentence?"

b. 5 is the sum and 2 and 3 are the addends in each addition sentence.

c. The subtraction shows that 5 minus either addend is equal to the other addend. That is, have the child give the difference in each subtraction sentence and point to that number.

RELATED AIDS

ACT. MASTERS—Gen. Use 2.

OBJECTIVE

To add and subtract in vertical form

PACING

Level A All
Level B All
Level C All

MATERIALS

addition and subtraction practice cards, sums 7 or less

SUGGESTIONS

Initial Activity Shuffle the addition and subtraction practice cards for sums and differences 7 or less. Show the cards one at a time and have the child give the sum or difference as quickly as possible. Place emphasis on accuracy rather than speed. Then have the child match cards that have the same number as a sum or difference.

ACTIVITIES

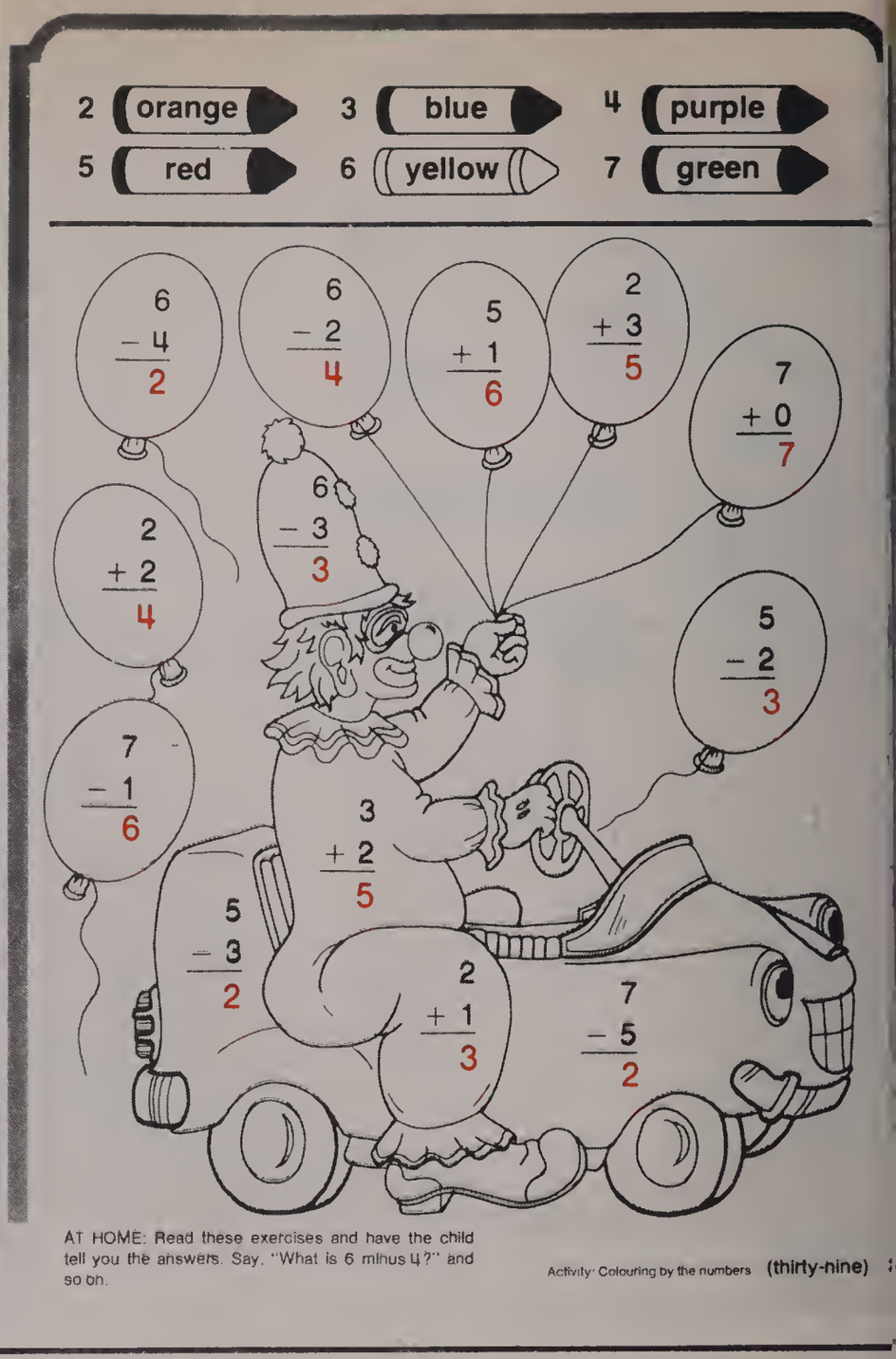
1. Adapt the game Stop the Magician described in the Activity Reservoir. Use addition and subtraction, sums 7 and less.

2. Draw on the chalkboard (or on a large piece of chart paper) a picture of a high brick-walled castle. Write several addition and subtraction exercises for sums 7 and less at various heights on the castle wall. Taking turns, each child has to correctly answer an exercise in order to climb the castle wall. The first child to reach the top of the wall wins.

3. Give the child oral practice with basic facts through sum 7. You might want to challenge some students with sum 8.

RELATED AIDS

ACT. MASTERS—Seasonal 1-4.
—Gen. Use 7-11, 13.



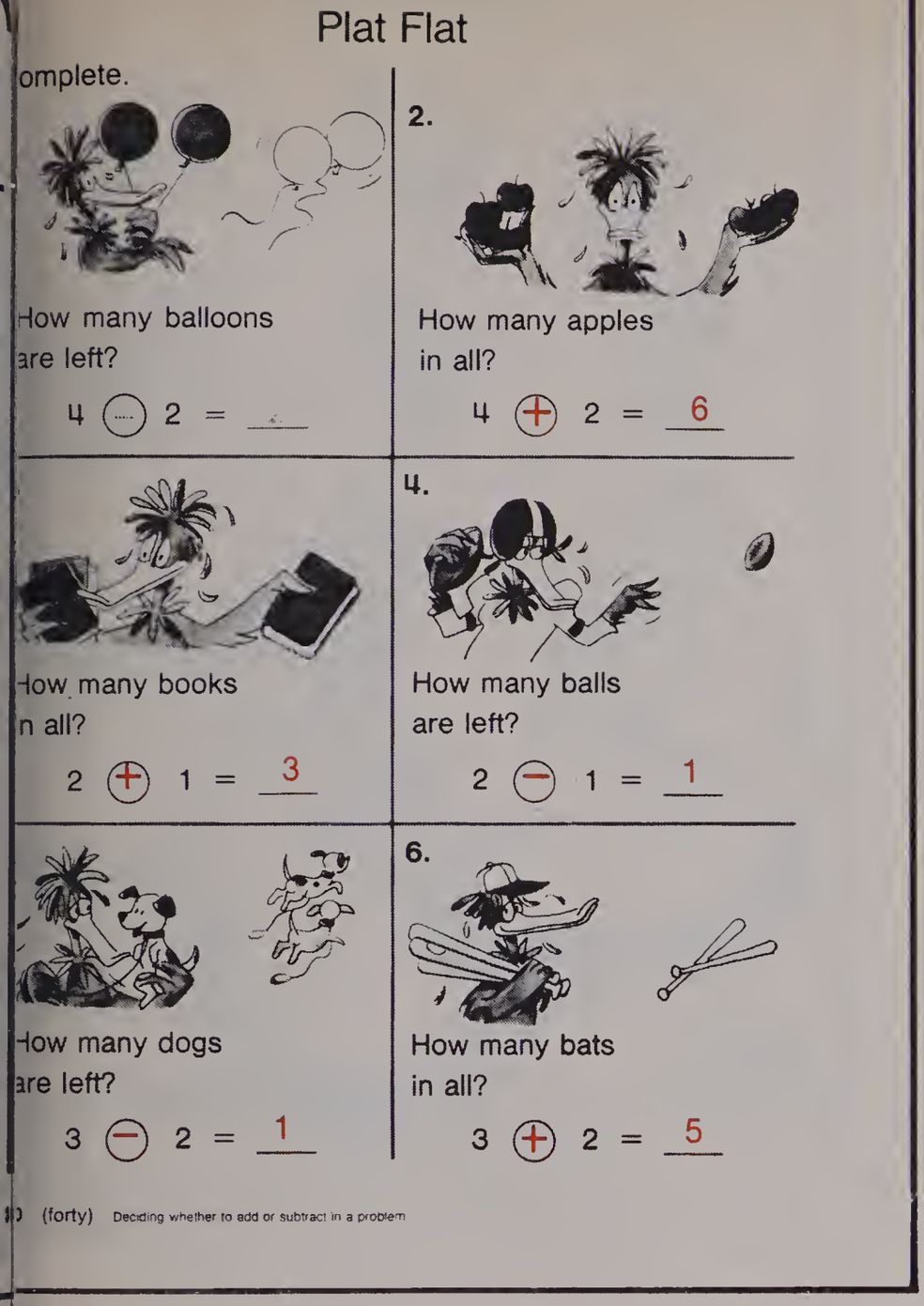
Using the Book For this activity page, first, have the child find each sum or difference. Remind the child to look at the signs "+" or "−." Tell the child to add if there is a plus sign and to subtract if there is a minus sign.

Activity: When the answers are completed, tell the child to color each part of the picture by the numbers.

Have the child read the numerals and name the colors at the top of the page. Ask, "What color goes with 2? (orange) with 3? (blue) etc."

Tell the child that the page is divided into parts. Each part is to be colored by the number in the answer. For example, in the first balloon on the upper left, the answer is 2, so, that part is colored orange.

At Home Upon completion of the pupil page, the child may take the page home and do the At Home activity suggested at the bottom of the page.



Using the Book Panel 1: Tell a story. "Plat Flat had 4 balloons. 2 balloons are floating away. How many balloons are left? (2)" Have the child decide whether to add or subtract, then trace the correct sign in the ring, and trace the answer 2.

Panels 2-6: Have the child tell a story about each picture so that the question in the panel is the last sentence in the story. Then have the child decide whether to add or subtract, write the appropriate sign and find the answer.

OBJECTIVE

To tell whether to add or subtract for a pictured problem and then complete the number sentence

PACING

Level A	All (1-4 guided)
Level B	All (1-2 guided)
Level C	All (1-2 guided)

SUGGESTIONS

Initial Activity As you dictate a story problem, write the appropriate numerals. Have the child tell whether to add or subtract, write the sign, and then find the answer.

ACTIVITIES

1. Let children play Mr. Add and Ms. Subtract, described below.

2. Two children may play a game. Have one child be Mr. Add and hang the "+" sign around the child's neck. The other child is Ms. Subtract and gets the "−" sign to wear. Make up little story problems or describe those on page 40. For each problem, one child must stand to show the proper operation to be used in solving the problem. Children take turns giving answers.

3. Write several puzzles on a transparency. For example:

4, 1 → 5
3, 1 → 2
0, 4 → 4

Tell the child that the numbers on the right are answers. Challenge the child to find out what was done to obtain each answer.

RELATED AIDS

ACT. MASTERS—Seasonal 5.
BFA PROB. SOLVING I—13-23.

OBJECTIVE

To practice adding and subtracting sums 7 or less

PACING

Level A All (1-2 guided)
Level B All (1-2 guided)
Level C All

MATERIALS

Basic Fact practice cards
(See Activity Reservoir.)

SUGGESTIONS

Initial Activities 1. Conduct a short practice session on the addition and subtraction facts, sums 7 and less, using practice cards. Use the cards in random order.

2. Conduct an oral drill without the practice cards. Say, "5 + 2, 5 - 3," and so on. Each time have the child give the answer.

ACTIVITIES

1. Adapt the game, Stop the Magician described in the Activity Reservoir.

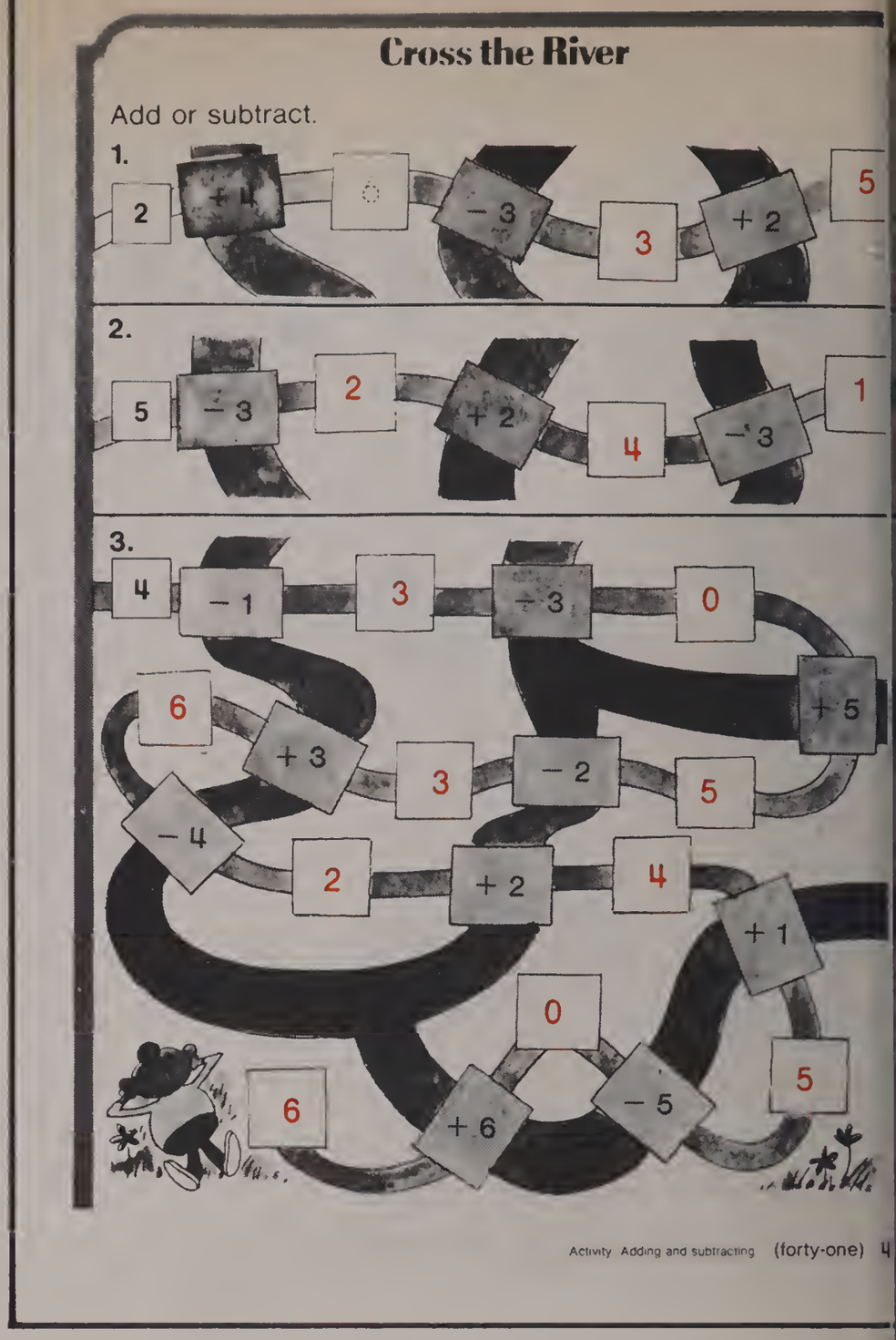
2. Duplicate two large sheets similar to the activity on page 41. Form two teams to play a relay game, Cross the River. The problems on the sheets must be identical. Children take turns writing the missing numbers to cross the river. The team with the right answers wins.

3. Adapt the relay game described in 1 above for speed. The team that finishes first wins.

4. Conduct an oral drill with several operations. For example, say, "6 minus 3 (pause) add 2 (pause) subtract 4. What is the answer? (1)"

RELATED AIDS

ACT. MASTERS—Seasonal 1-4.
—Gen. Use 7-11, 13.



Using the Book For this activity, the child is to complete the frames to Cross the River.

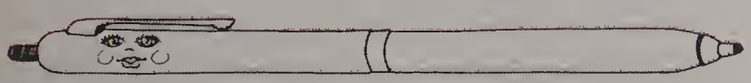
Panel 1: Have the child start with 2 and follow the path. Ask the child to read what is written on the first bridge. Then ask, "2 plus 4 is equal to what number?" Have the child trace 6 in the yellow square. Then ask, "6 minus 3 is equal to what?" Have the child write 3 in the next square. Let the child ask the next question and finish this panel.

Panels 2-3: Show the child where to begin. Guide the child through the answer for the first square. Have the child follow the path to complete the rest of the squares.

Keeping Fit

Add.

1.	1 + 2 = 3	2 + 3 = 5	6 + 0 = 6	4 + 1 = 5	3 + 2 = 5	0 + 0 = 0
2.	5 + 1 = 6	3 + 4 = 7	1 + 4 = 5	2 + 2 = 4	2 + 5 = 7	4 + 2 = 6
3.	2 + 4 = 6	0 + 3 = 3	3 + 3 = 6	6 + 1 = 7	4 + 3 = 7	3 + 1 = 4



Subtract.

4.	3 − 1 = 2	2 − 0 = 2	5 − 3 = 2	3 − 2 = 1	2 − 1 = 1	4 − 2 = 2
5.	3 − 3 = 0	4 − 3 = 1	5 − 1 = 4	7 − 2 = 5	6 − 3 = 3	7 − 5 = 2
6.	5 − 4 = 1	7 − 6 = 1	4 − 1 = 3	7 − 4 = 3	6 − 4 = 2	6 − 5 = 1

Using the Book Panels 1-3: For each panel, have the child add.
Panels 4-6: For each panel, have the child subtract.

OBJECTIVES

To review and maintain the following skills:

To add in vertical form, sums 7 or less [25]

To subtract in vertical form, from 7 or less [31, 37]

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

If children have unusual difficulty with the exercises on this page, you could provide appropriate remedial work. The page references following the objectives are keyed to the lessons in which the concept is taught.

ACTIVITIES

1. Let several children work with basic fact practice cards and objects if necessary for finding sums and differences, 7 or less.

2. Adapt the game, Stop the Magician, described in the Activity Reservoir. Use addition and subtraction, sums 7 or less.

3. Use the Basic Fact Practice Cards game described in the Activity Reservoir for sums and differences 7 or less.

RELATED AIDS

ACT. MASTERS—Seasonal 1-4.
—Gen. Use 7-11, 13.

OBJECTIVE

To evaluate achievement of the Chapter Objectives

PACING

Level A All
Level B All
Level C All

SUGGESTIONS

The Chapter Test is designed to be used in a diagnostic manner. It assesses the child's knowledge of the main concepts and skills that were taught in this Chapter. Some children should take this test independently with guidance for instructions only. Use judgment as to whether certain children should be guided through some or all of the exercises. Check each child's work and mark the items that are incorrect. Reteaching or extra practice might be necessary to help the child acquire the concept or skill that was missed. With this reteaching, you will be able to ascertain whether the child has then learned the topic in question. See Using the Book for page references indicating where the concept or skill was taught.

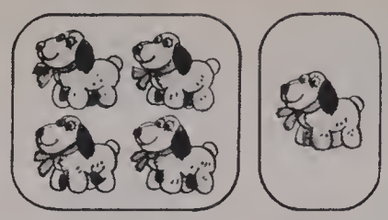
ACTIVITIES

1. You might wish to draw sets on paper plates. Cut them up.

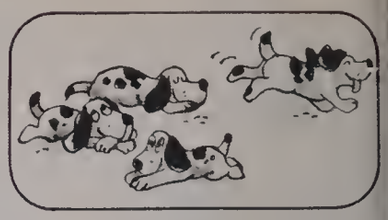
Mix the pieces and place them face down. Have the child pick a piece and find its mate; name the number on each piece of the puzzle, then name the total number on the plate. The child should count only to check an answer.

2. Extend this activity by including vertical exercises on one puzzle piece and answers on the other piece. Have the child match the pieces, then select drawn sets (made above) to represent the exercise.

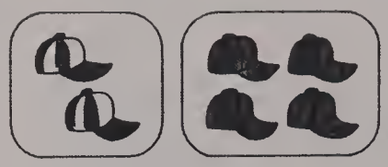
Complete.

1. 

4 + 1 = 5

2. 

4 − 1 = 3

3. 

2 + 5 = 7
2 + 4 = 6
1 + 3 = 4

4. 2 + 5 = 7
5 + 2 = 7

5. Add.

6	0
+ 0	+ 6
6	6

6. Add.

2	1	6	4	3	3
+ 3	+ 5	+ 0	+ 3	+ 3	+ 1
5	6	6	7	6	4

7. Subtract.

6	7	5	4	3	7
− 3	− 1	− 0	− 4	− 2	− 6
3	6	5	0	1	1

Chapter 3 Test (forty-three) 43

Using the Book This is a diagnostic test. The page references are given for reteaching as needed. The letter indicates the objective.

Panels 1-2: Assist the child in describing the pictures. Then tell the child to write the sum or difference. [pages 25, 31 A, B]

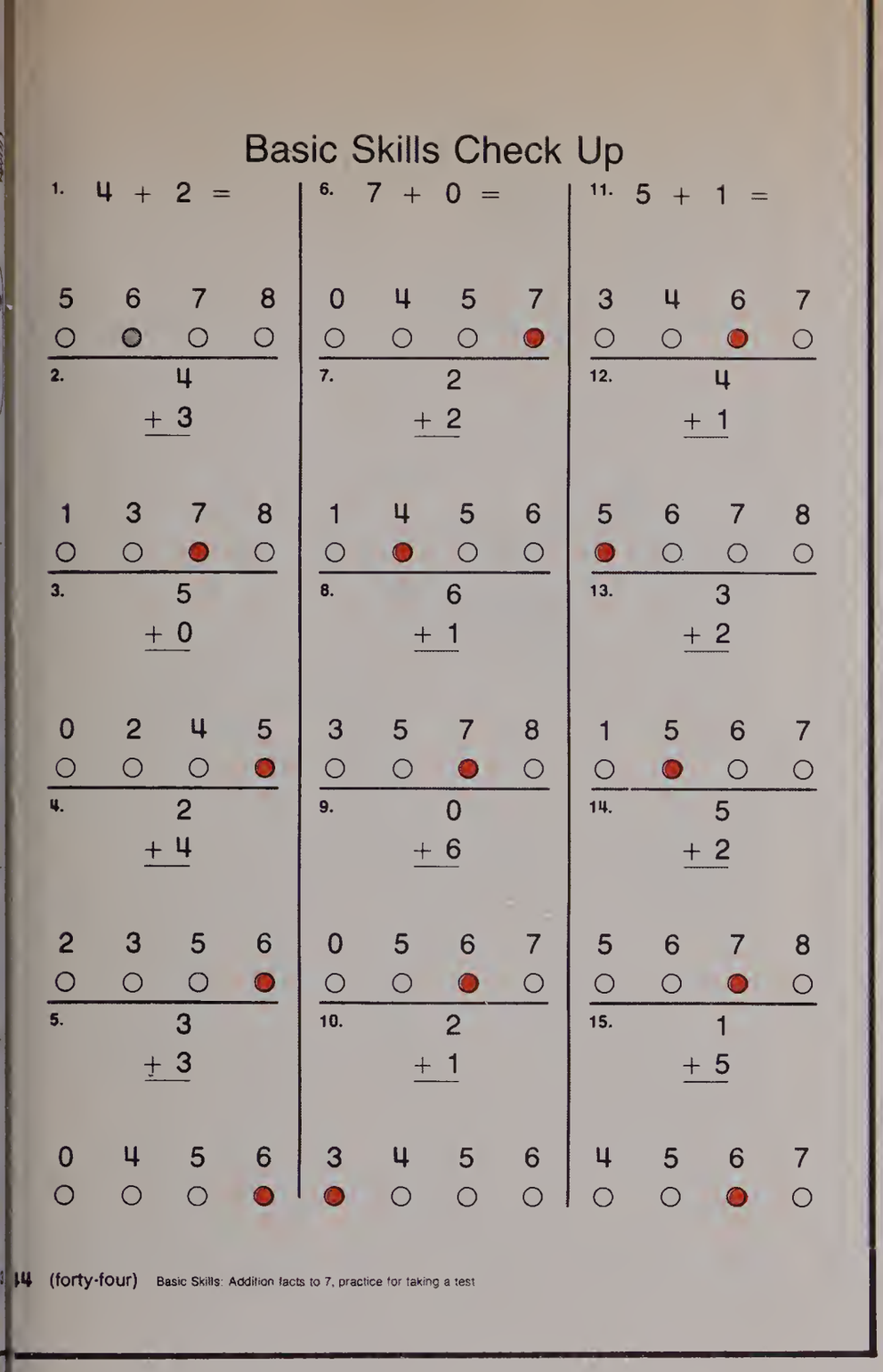
Panel 3: Have the child ring the addition sentence that goes with the picture problem. [page 35 E]

Panel 4: Have the child complete the sentences showing the addition and subtraction family. [page 38 D]

Panel 5: Have the child give the sums. [page 29 C]

Panel 6: Have the child add. [page 25 A]

Panel 7: Have the child subtract. [page 31 B]



Using the Book Panel 1: Direct the child to 4 plus 2. Ask, "4 plus 2 equals what number? (6)" Tell the child to look at the numbers below the example. Have the child find the number 6. Say, "Look at the circle below the 6. The circle that goes with the number 6 is filled in to show that this is the answer, 4 plus 2 equals 6." Have the child darken the circle over the grey screen.

Panel 2: Direct the child to 4 plus 3. Ask, "4 plus 3 equals what number? (7)" Tell the child to look at the numbers below. Have the child find the number 7. Say, "Fill in the circle below the number 7 to show your answer. 4 plus 3 equals 7."

Panels 3-15: Have the child add and fill in the correct circle to show the answer. Make sure the child understands how to indicate the answer correctly. Then the child can proceed alone to finish the page. Some children may want to work out the answers on a separate sheet of paper.

OBJECTIVE

To add sums to 7

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

The purpose of this page is to provide experience in the type of format that may be used on standardized tests, and so is an optional lesson. Some children may do this page independently with guidance for instructions only. Use judgement as to whether certain children should be guided through some or all of the exercises. On standardized tests at this grade level, all directions are oral. The "Using the Book" section gives guidance for administering this page. Notice that the circles for answers are all arranged horizontally on these pages to give practice with this format. In filling in the circles make sure that the child presses down with the pencil to make a dark mark. Do not be concerned if the child does not fill in the circles exactly.

This page may be used in a diagnostic manner. Reteaching or extra practice may be necessary for those children who have difficulty with a particular skill. The chart below shows the page numbers where the skill was taught.

Skill	Page
sums to 7	25

ACTIVITIES

Have children play Basic Fact Wheels, as described in the Activity Reservoir. Use addition facts to sum 7.

OBJECTIVE

To subtract from 7 and less

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

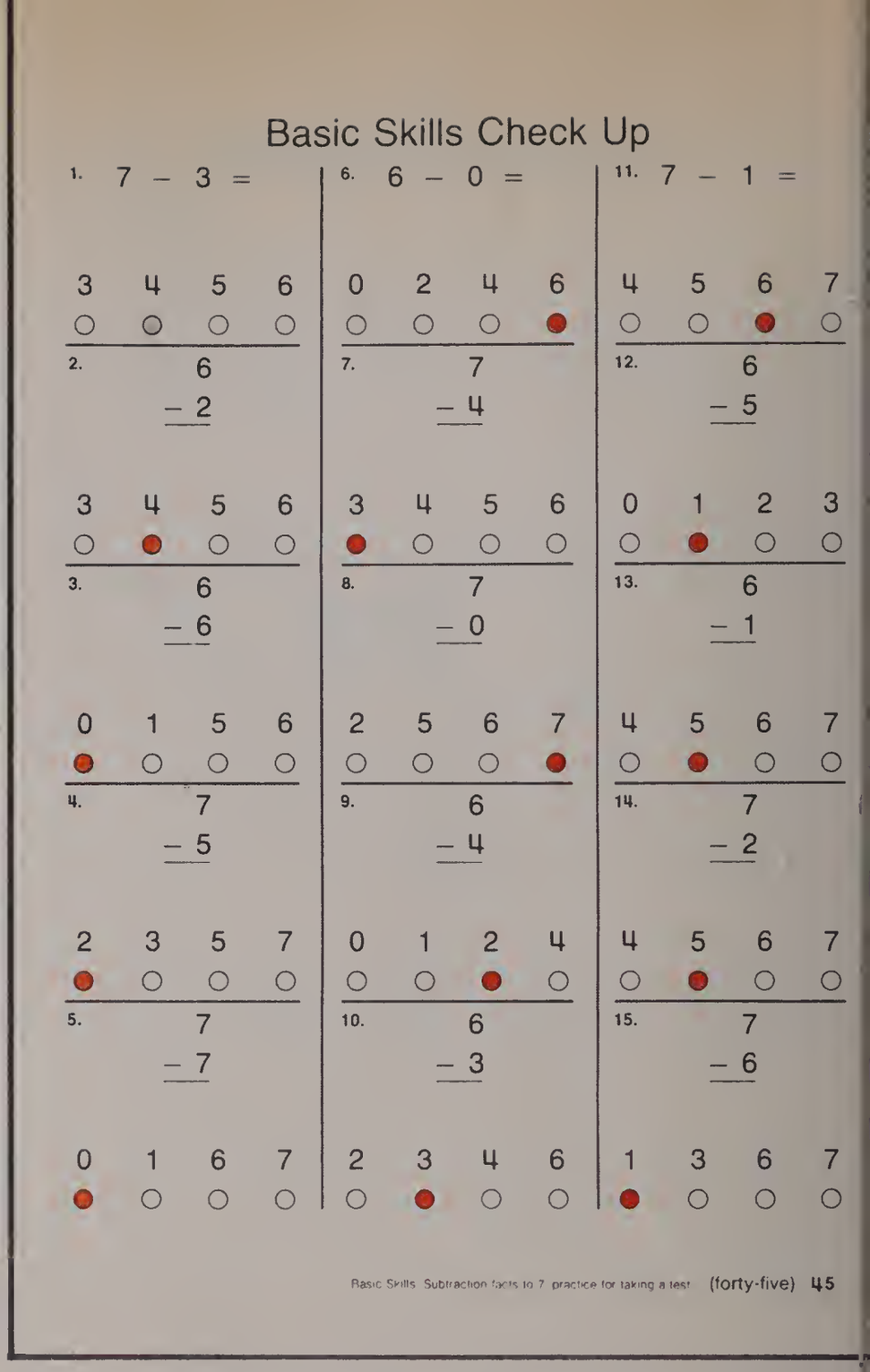
The purpose of this page is to provide experience in the type of format that may be used on standardized tests, and so is an optional lesson. Some children may do this page independently with guidance for instructions only. Use judgement as to whether certain children should be guided through some or all of the exercises. On standardized tests at this grade level, all directions are oral. The "Using the Book" section gives guidance for administering this page. Notice that the circles for answers are all arranged horizontally on these pages to give practice with this format. In filling in the circles make sure that the child presses down with the pencil to make a dark mark. Do not be concerned if the child does not fill in the circles exactly.

This page may be used in a diagnostic manner. Reteaching or extra practice may be necessary for those children who have difficulty with a particular skill. The chart below shows the page numbers where the skill was taught.

Skill	Page
subtracting from 7 and less	31

ACTIVITIES

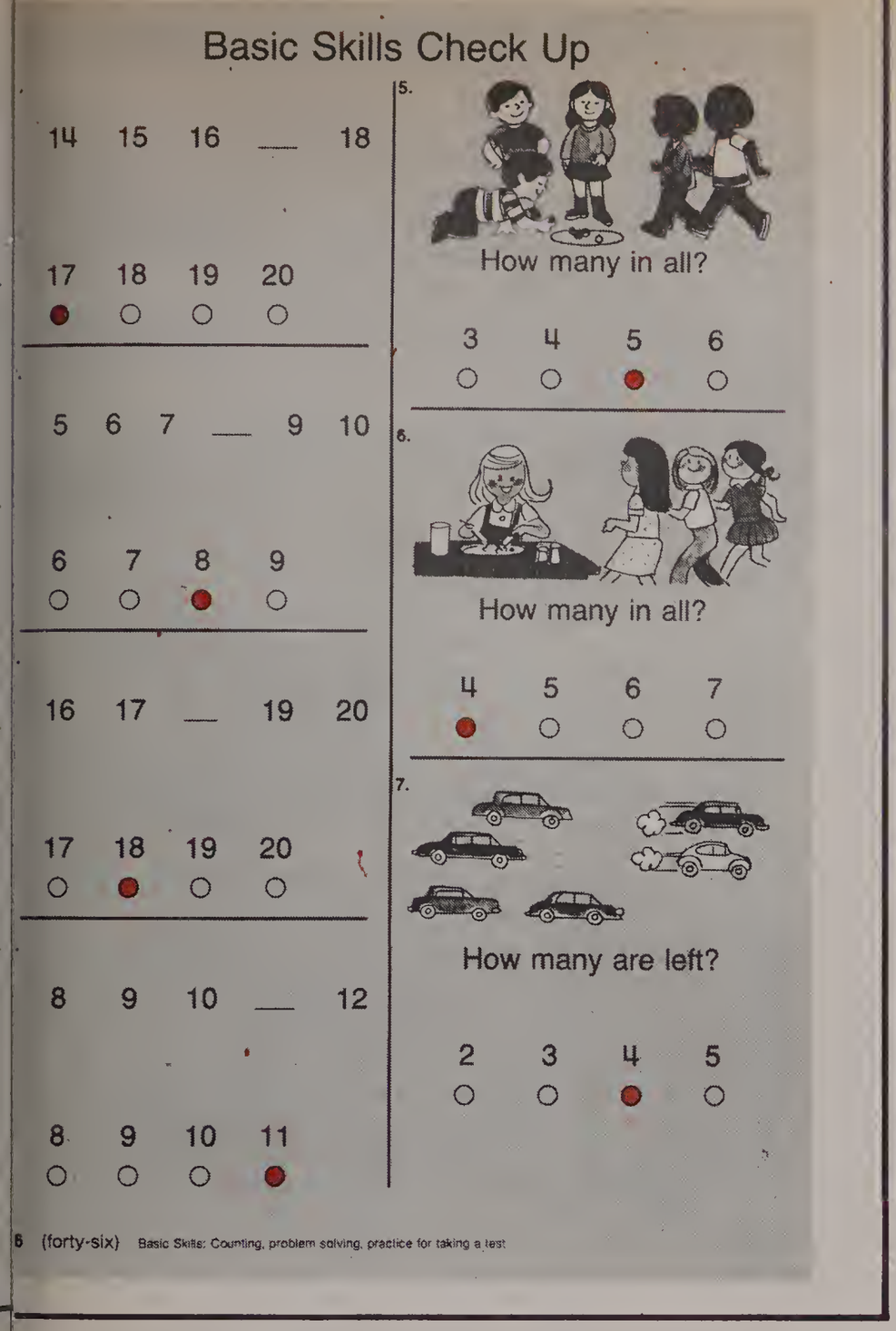
Prepare jigsaw puzzle subtraction cards (each with a different cut). Let children see who can fit the cards together first.



Using the Book Panel 1: Direct the child to 7 minus 3. Ask, "7 minus 3 equals what number? (4)" Tell the child to look at the numbers below the example. Have the child find the number 4. Say, "Look at the circle below the 4. The circle that goes with the number 4 is filled in to show that this is th answer, 7 minus 3 equals 4." Have the child darken the circle over the grey screen.

Panel 2: Direct the child to 6 minus 2. Ask, "6 minus 2 equals what number? (4)" Tell the child to look at the numbers below. Have the child fin the number 4. Say, "Fill in the circle below number 4 to show your answer. 6 minus 2 equals 4."

Panels 3–15: Have the child add and fill in the correct circle to show the answer. Make sure the child understands how to indicate the answer correctly. Then the child can proceed alone to finish the page. Some children may want to work out the answers on a separate sheet of paper.



OBJECTIVES

To count to 20
To solve problems using addition and subtraction

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

The purpose of this page is to provide experience in the type of format that may be used on standardized tests, and so is an optional lesson. Some children may do this page independently with guidance for instructions only. Use judgement as to whether certain children should be guided through some or all of the exercises. On standardized tests at this grade level, all directions are oral. The "Using the Book" section gives guidance for administering this page. Notice that the circles for answers are all arranged horizontally on these pages to give practice with this format. In filling in the circles make sure that the child presses down with the pencil to make a dark mark. Do not be concerned if the child does not fill in the circles exactly.

This page may be used in a diagnostic manner. Reteaching or extra practice may be necessary for those children who have difficulty with a particular skill. The chart below shows the page numbers where the skill was taught.

Skill	Page
counting to 20	9
problem solving	35, 36

Using the Book Panel 1: Direct the child to the number pattern. Tell the child, "We are going to count by ones." Read, "14, 15, 16." Ask, "What number comes next? (17) Does 18 come after 17? (yes)" Make sure that each child verifies that 17 is the missing number. Say, "Look at the circle below 17. The circle that goes with the number 17 is filled in to show that this is the answer. Have the child darken the circle over the grey screen.

Panels 2-4: Have the child count by ones to find the missing number, and fill in the correct circle. Make sure the child understands how to indicate the answer correctly.

Panel 5: Direct the children to the picture. Say, "Let's make up a story about the picture. There are three children playing marbles. Two more children are coming to play marbles. How many children are there in all? (5) 3 plus 2 equals 5." Direct the child to fill in the correct circle.

Panels 6-7: Have the child look at the picture and fill in the circle to show the answer.

ACTIVITIES

Two children may work with numeral cards 0-20. The children take turns. One child shows one of the numeral cards 0-20. The other child gives the number that comes just before (or just after) this number.

CHAPTER 4 OVERVIEW

This chapter reviews the numbers 10 through 100. Counting and comparing are involved and the child works with expanded and two-digit numerals. Telling time is concentrated on in the unit.

The theme for this chapter is "Fairy Tales."

OBJECTIVES

A To count through 100
B To write the numerals 0 through 100
C To compare pairs of numbers, each 100 or less
D To count by twos, fives, and tens
E To tell the time to the hour, the half hour, and at five-minute intervals.

VOCABULARY

tens 47
tenth 47
count by tens 47
ten-box 47
ones 48
expanded numeral 48
two-digit numeral 48
fives 59
twos 60
odd 60
even 60
hour 63
half hour 63
minute 64
minute hand 64
o'clock 64
hour 64
between 64
minutes 66
one half 66

BACKGROUND

1. We may use an understanding of addition to develop the idea of place value. For example, we have a set with 2 ten-boxes and a set of 5 blocks. Consider joining the two sets and then the number of blocks is 2 tens + 5 ones. This expanded numeral leads to the two-digit numeral, 25. Then it can be seen that the 2 in 25 means 2 tens and the 5 means 5 ones. Therefore, the 2 in 25 is in the tens place, while the 5 is in the ones place.

Since 5 means 5 ones, then immediately after introducing expanded numerals such as 2 tens + 5 ones, the word ones is omitted and the expanded numeral is written 2 tens + 5.

Since 2 tens = 20, then 2 tens + 5 = 20 + 5 and 20 + 5 is another type of expanded numeral.

2. At this level of work in comparing numbers, it is well to keep in mind the three ways in which we may determine which of two numbers is greater.

a. Using Sets—This method is wearisome and clumsy as numbers become greater.
b. Counting—When counting, each number named is greater than the one before it. It is, therefore, less than those numbers named after it.
c. Place Value—If the digits in the tens place are different, the numeral that shows more tens names the greater number. If the digits in the tens place are the same, the numeral that names more ones is the greater number.

3. Telling time is, of course, a concept mastered only through daily practice. The pace of lessons in the chapter may move more quickly than some of your children can handle. It is suggested that pages 63-68 in the pupil book be collected from those children whose time concepts are primitive and held until they are more mature.

MATERIALS

lored blocks
) full ten-boxes
) blocks
) buttons
ldition and subtraction practice cards
astic spoons (76 of one colour and 19 of another colour)
ır graphs from the worktable
ıper dolls or puppets
monstration clock
ımeral cards for 0 through 100

CAREER AWARENESS

ruck Mechanics [62]

rucks are essential in transporting food, equipment, erchandise, and all types of materials, locally and ıtionally. Truck mechanics are needed to keep the ucks and buses in operation and to reduce breakdowns.

These mechanics repair large engines, complex ansmissions and differentials, air-brakes, and other com-ponents that are different from those on automobiles. ometimes they use common hand tools such as wrenches, rewdrivers, and pliers. They also use power and machine ols, such as pneumatic wrenches and drills, welding and ame cutting equipment, and jacks and hoists to lift and ove large heavy parts.

It is important that children develop an awareness of lf and others. Children should realize that these mecha-cs are responsible for trucks running safely and efficient-. A truck mechanic can save the lives of the truck drivers d the lives of other drivers on the road.

Photo description: This truck mechanic is employed a large organization that maintains its own vehicles. He ends much time doing preventive maintenance to assure fe vehicle operation. During this maintenance check the echanic is tightening a valve cover.

ULLETIN BOARD

Direct a group of children in making a display that ows how to read two-digit numerals. Write number mes in one column and the reading of each number me in a second column. For example:

number name	we read
2 tens + 5 ones	two tens plus five ones
20 + 5	twenty plus five
25	twenty-five

ıe display shows we read a two-digit numeral just like we ad the second expanded numeral except we omit the word lus."

2. Practice in telling time can be encouraged by using children's art work as a focus for a bulletin board.

It might be pleasurable for each child to make a diary. He or she can draw or cut out magazine pictures of various times of day, for example: wake-up time, eating breakfast, going to school, eating dinner, going to bed. Next to each little scene, the child can paste a clockface and draw the minute and hour hands. Beneath each clock, the child writes the time. Then staple these pages together. In order to provide clockfaces, you may duplicate sheets of them or use a prepared stamp with an ink pad. You may want to include numerals 12, 3, 6, and 9 on the clockfaces.

Hang the children's journals and a large demonstration clockface where they are easily accessible. Some children may enjoy not only reading the times shown on a classmate's clockfaces, but also reproducing some times on the large clock.

3. Have the children help construct a very large numeral chart from 0 through 100. Such a bulletin board not only is a learning experience in its preparation, but continues as a constant source of reference as well as a natural focus for quick games involving counting through 100.

Yarn sold as gift wrapping tie might make a colorful and easily seen grid. Have children help tie numeral cards in the appropriate boxes of the grid.

SPECIAL NOTES

1. The use of color on ten-boxes and single blocks is used in two ways as an aid to understanding place value. 1) In all place-value lessons each color represents a different place in a numeral. For example, in 2 tens + 4, 2 ten-boxes for the tens place are both one color; and 4 single blocks for the ones place are all another color. 2) In lessons on comparing numbers each number is represented by a different color. For example, in comparing 33 and 53, boxes and blocks for 33 are all one color; and boxes and blocks for 53 are all another color.

2. You might want to discuss the consumer aspects of page 62. Discuss the effects of air pollution, fuel consumption, noise pollution, traffic jams, etc.

OBJECTIVE

To count by tens through 100

PACING

Level A All (1-3 guided)
Level B All (1-2 guided)
Level C All

VOCABULARY

count by tens, ten-box, tens, tenth

MATERIALS

10 full ten-boxes

SUGGESTIONS

Initial Activities (If ten-boxes are not available, you may use ten-bundles of sticks.)

1. Show a ten-box of blocks. Have the child count the blocks in the box. Ask, "How many blocks are in the box? (10)" Explain that we may call the box a ten-box.

2. Give the child 10 ten-boxes of blocks. Ask, "How many blocks are in each box? (10)" Have the child count the blocks by tens, saying, 1 ten, 2 tens, 3 tens, and so on, as you write 10, 20, 30, etc., through 100. The child then counts the blocks saying 10, 20, 30, and so on, through 100.

ACTIVITIES

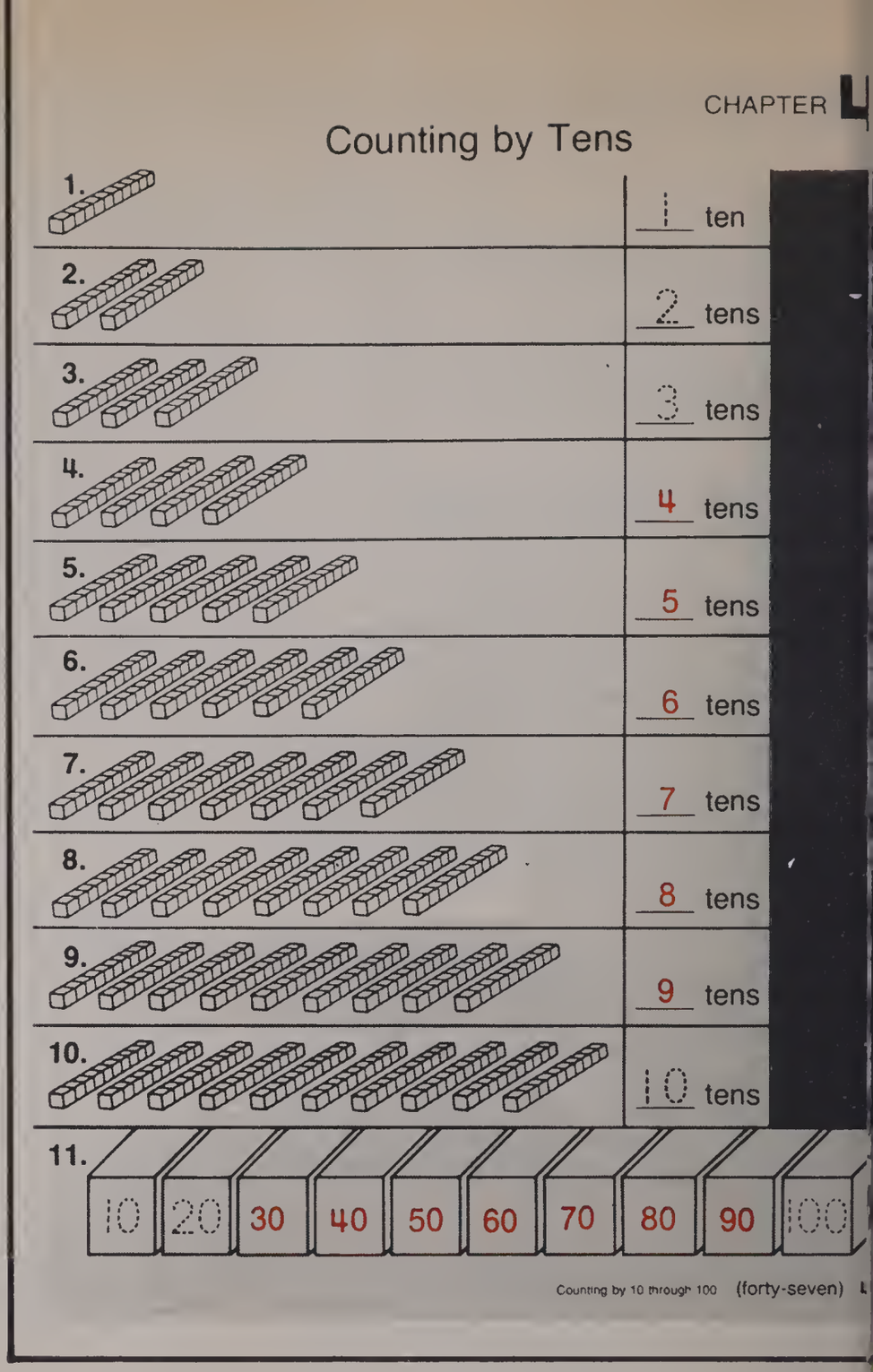
1. Ask the child to assemble sets from the worktable or find something "there might be 100 of" to show 1 big set that has 10 tens.

2. Let groups of children collect 100 things such as bottle tops, rocks, etc. Group the things by tens as they are brought to class. Label each group of things with ___ tens until there are 10 tens. Then label as 10 tens = 100.

3. Have the child make a poster with 100 things on it grouped by tens. Label the poster as 10 tens = 100.

RELATED AIDS

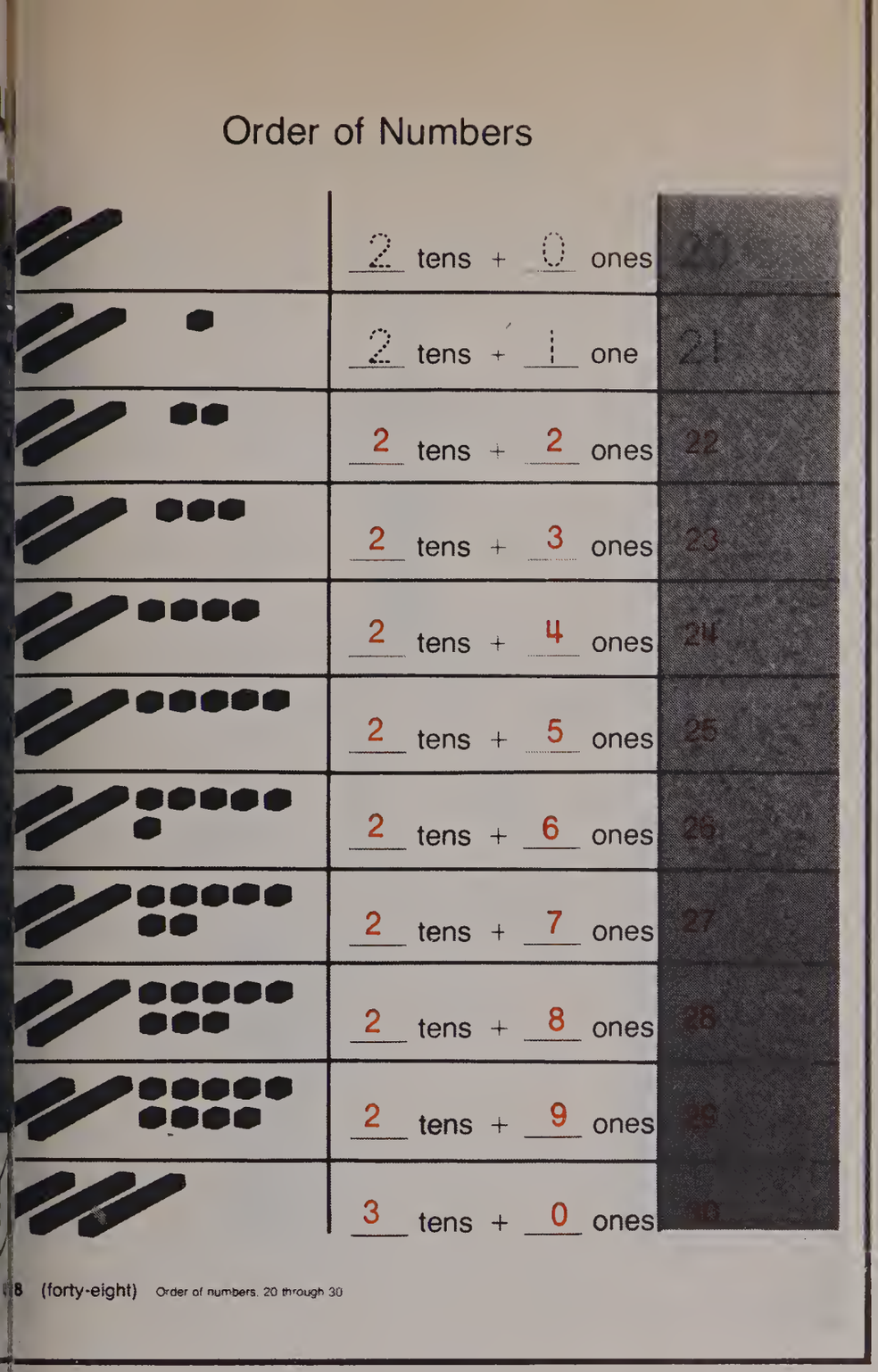
BFA COMP LAB I—27.



Using the Book Panels 1-2: Explain that each ten-box contains ten blocks. For panel 1, have the child tell how many ten-boxes there are. Have the child trace the numeral 1 to show how many tens and read, 1 ten. Then trace and read the numeral 10. Continue in this manner for panel 2.

Panels 3-10: For each row, have the child write how many tens are in the blank and write the numeral in the blue column. When the panel is completed, ask the child to read down the blue column.

Panel 11: Have the child write the numerals used when counting by tens to 100.



Using the Book Have the child tell the number of ten-boxes and blocks in each row. Elicit that, after the first, each row has one more block than the previous row.

Panels 1-2: Ask, "How many tens? (2)" Have the child trace the 2. "How many ones? (0)" Trace the 0. Have the child read the phrase 2 tens + 0 ones. Ask, "How many blocks in all? (20)" Have the child trace the two-digit numeral, 20. For panel 2, ask, "How many tens? (2) How many ones? (1)" Have the child trace the numerals 2 and 1 and read the phrase 2 tens plus 1 one. Then have the child trace the two-digit numeral 21.

Panels 3-11: Have the child complete the expanded numerals and then write the two-digit numerals.

After the assignment is completed, you may ask the child to read the numerals in the right column, top to bottom.

OBJECTIVES

To write expanded numerals and two-digit numerals
To order the numerals 20 through 30

PACING

Level A All (1-3 guided)
Level B All (1-2 guided)
Level C All (1-2 guided)

VOCABULARY

expanded numeral, two-digit numeral, ones

MATERIALS

2 ten-boxes, 6 blocks

BACKGROUND

See Item 1 of Chapter Overview Background.

SUGGESTIONS

Initial Activity Show 2 ten-boxes and 6 blocks. Ask, "How many ten-boxes? (2) Loose blocks? (6)" Write 2 tens + 6 ones. Say, "2 tens + 6 ones is an expanded numeral." Tell the child there is another way to show the number of blocks. Write the two-digit numeral 26 and tell what the digits 2 and 6 mean.

ACTIVITIES

1. Adapt the matching activity below.

2. Have the child sort expanded numeral cards and two-digit numeral cards in matching pairs.

3. Direct the child in preparing Bulletin Board suggestion 1 in the Chapter Overview. (This will be taught on page 51.)

RELATED AIDS

ACT. MASTERS—4.
—Gen. Use 3.
BFA COMP LAB I—20.

OBJECTIVES

To write expanded numerals and two-digit numerals

To know tens place and ones place in two-digit numerals

PACING

Level A	55 All (1-4 guided) 56 All
Level B	55 All (1-3 guided) 56 All
Level C	55 All (1-3 guided) 56 All

MATERIALS

3 ten-boxes, 8 blocks

BACKGROUND

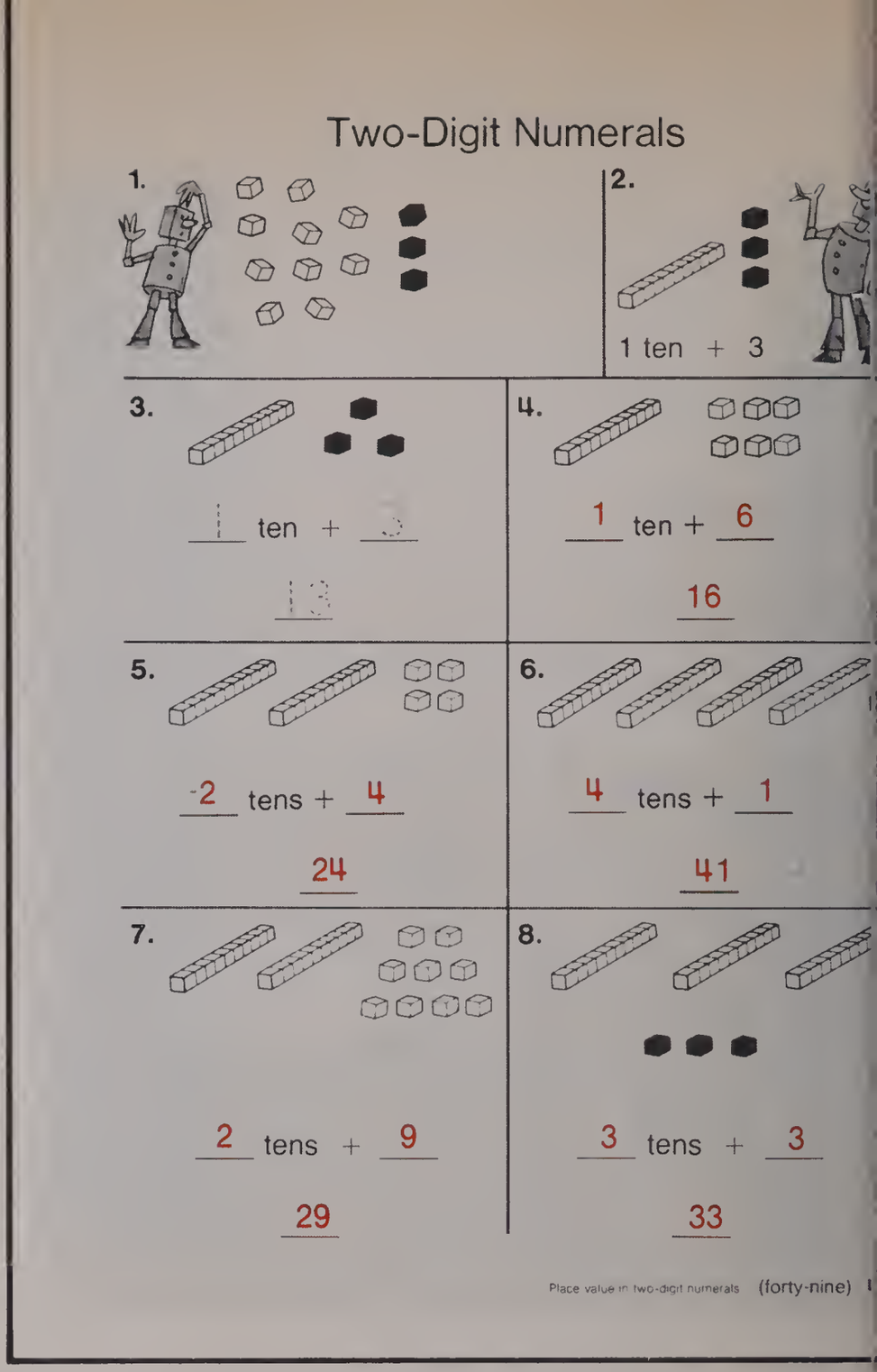
See Item 1 in the Background of the Chapter Overview.

SUGGESTIONS

Initial Activity Show a set of 3 ten-boxes of blocks and a set of 8 blocks. Write:

___ tens + ___ ones

Have the child give the number of tens in the set of ten-boxes, then the number of ones in the set of loose blocks. Remind the child that when we put two sets together, we may add to show how many there are all together. Write: 3 tens + 8. Explain that since 8 and 8 ones name the same number, we may write: 3 tens + 8, which is another expanded form. Ask, "What does the 3 mean? (3 tens) What does the 8 mean? (8 ones)" Tell the child there is another way to show the number of blocks. Develop and write the two-digit numeral. Have the child tell what each of the digits 3 and 8 mean in 38.



Using the Book Panels 1-3: For panel 1 ask, "How many yellow blocks are there? (10) How many green blocks do you see? (3)" For panel 2, ask, "How many blocks have been put in the ten-box? (10) How many ten-boxes? (1) How many ones are left over? (3)" Have the child read the sentence 1 ten + 3. Then ask, "How many blocks are there all together? (13)" For panel 3, have the child trace the numerals as you explain to the child the relationship between the ten-box and blocks and the expanded and two-digit numerals shown. You may ask the child to ring the digit in the two-digit numeral that means one ten. Ask, "What does the 3 mean in 13? (3 ones)"

Panels 4-8: Have the child look at the blocks, fill in the expanded numerals, and then write the two-digit numerals.

Complete.

1.

2 tens + 0 = 20

1 ten + 6 = 16

8 tens + 9 = 89

3 tens + 5 = 35

9 tens + 2 = 92

2 tens + 7 = 27

7 tens + 2 = 72

2.

4 tens + 8 = 48

7 tens + 1 = 71

5 tens + 0 = 50

6 tens + 6 = 66

4 tens + 4 = 44

1 ten + 3 = 13

3 tens + 1 = 31

3.

tens	ones	two-digit numeral
6	3	
1	1	
3	0	
7	5	

4.

tens	ones	two-digit numeral
2	8	
9	4	
2	2	
5	9	

sing the Book Panels 1-2: Read the first sentence, 2 tens + 0 = 20, with the ild and have the child trace the two-digit numeral, 20. Then have the child rite the two-digit numeral for each expanded numeral.

When both panels are completed, call attention to the last two rows in ch panel. Elicit that if we change the tens digit and the ones digit, we change e number. Then point out numbers in which the tens and ones digits are the me, i.e., 44, 22, 33, etc.

Panels 3-4: Explain that this chart shows how many tens, how many es, and the two-digit numeral. Ask, "How many tens? (6) How many es? (3)" Have the child say "6 tens and 3 ones," and trace and read the meral, 63. Then have the child write the two-digit numeral in each row of ch chart.

ACTIVITIES

1. The child might enjoy playing Computer. One child (the input) shows a card with an expanded numeral, the other child (the output) gives or writes the two-digit numeral.

2. Group several children for a place value game. Team 1 begins by showing a set of ten-boxes and blocks of their choice. Team 2 must show the expanded numeral and a two-digit numeral card for that number. If Team 2 is correct, they score 1 point and then show a different expanded and two-digit numeral for which Team 1 has to show the correct number of blocks. If Team 2 was incorrect the first time, Team 1 gets the point and continues showing blocks. Ten points determine the winner.

3. Reproduce a chart similar to panels 3 and 4 on page 50. Have the child use blocks and boxes to illustrate the tens and ones, then write the two-digit numeral.

4. Adapt the game Pop Up described in the Activity Reservoir in front of the book. Given a set of two-digit numerals, the child gives an expanded numeral for each.

5. Provide a table similar to:

10 less		10 greater
	31	
	32	
	33	

Challenge the child throughout the year to complete the chart for these and other numbers.

RELATED AIDS

ACT. MASTERS—4.
—Seasonal 6.
—Gen. Use 3.

OBJECTIVE

To write and read two-digit numerals given an expanded numeral such as 60 + 4

PACING

Level A	51 All (1-3 guided) 52 All
Level B	51 All (1-2 guided) 52 All
Level C	51 All (1-2 guided) 52 All

MATERIALS

2 ten-boxes of blocks, 5 blocks

SUGGESTIONS

Initial Activities 1. Write 2 tens + 5. Have the child write the two-digit numeral and illustrate 25 by using blocks. Ask the child what the two-digit numeral is for 2 tens, then develop the idea that there is another expanded numeral for 25: 20 + 5.

2. Write: 2 tens + 5
20 + 5
25

Tell the child that 20 + 5 names the same number as 2 tens + 5 ones. Tell the child that the two-digit numeral (touch 25) may be *read* almost like 20 + 5. Just leave out the word "plus." Have the child read each row of numerals.

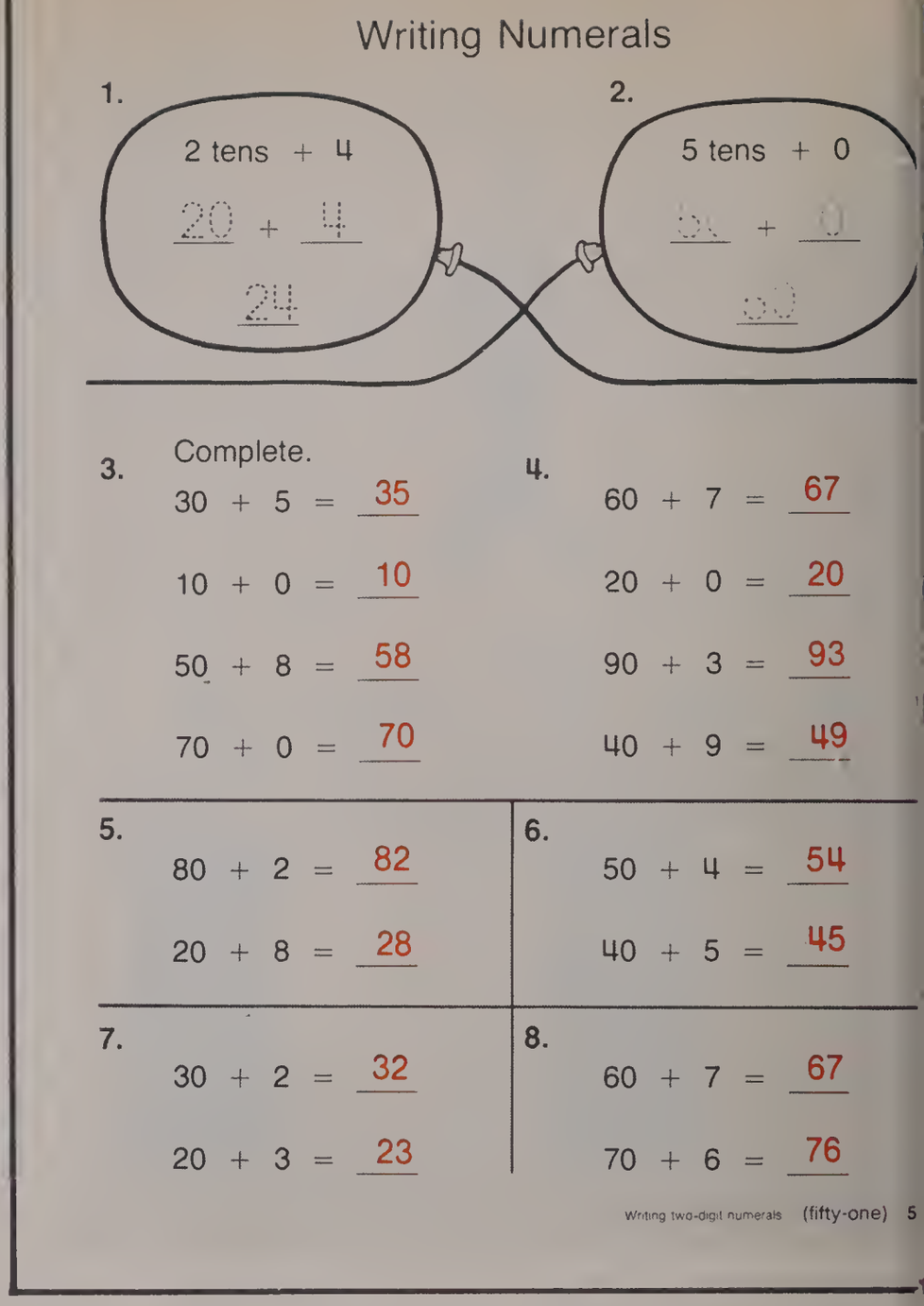
3. Write examples, such as:

40 + 7 = ___ 20 + 6 = ___
70 + 4 = ___ 30 + 0 = ___

Have the children complete and read each sentence. They may illustrate using blocks.

4. Write: 20 + 8 = ___
20 + 9 = ___
30 + 0 = ___
30 + 1 = ___
30 + 2 = ___

Have the child write the two-digit numerals, and tell what each digit means. Discuss the idea that each number is one greater than the preceding number. Use blocks to strengthen this understanding. Repeat this activity using 40 + 8 = ___ through 50 + 2 = ___.



Using the Book Panel 1: Have the child read the first sentence, 2 tens + 4. Associate 2 tens with the 20 below it and 4 with the 4 below it. Have the child trace these numerals. Then associate 20 + 4 with the 24 below it and have the child trace this two-digit numeral. Explain that these are different names for the same number and each form is shorter than the previous form.

Panel 2: Follow procedures similar to panel 1.

Panels 3-8: Tell the child to read each expanded numeral and write the two-digit numeral to complete each sentence.

Complete.

1. 20 + 8 = ( )
20 + 9 = 29
30 + 0 = 30
30 + 1 = 31
30 + 2 = 32
30 + 3 = 33

2. 50 + 8 = 58
50 + 9 = 59
60 + 0 = 60
60 + 1 = 61
60 + 2 = 62
60 + 3 = 63

3. 70 + 9 = 79
80 + 0 = 80
80 + 1 = 81
80 + 2 = 82
80 + 3 = 83
80 + 4 = 84

4. 80 + 9 = 89
90 + 0 = 90
90 + 1 = 91
90 + 2 = 92
90 + 3 = 93
90 + 4 = 94

52 (fifty-two) Practice

Using the Book Panels 1-4: Have the child write the two-digit numeral for each expanded numeral. After the exercises are completed, ask the child to read the two-digit numerals in panel 1 (twenty-eight, twenty-nine, and so on). Then ask the child to count from 28 to 33 without looking at the page. Next, the child may count from 38 to 43, and then from 68 to 83.

Some children may volunteer to count beyond one hundred. This will help you to gather some information about your children's ability to count.

ACTIVITIES

1. Prepare 2 cards – one showing 49 and one showing 40 + 9. Make similar cards to go with 94, 43, 34, 39, and 93. Shuffle the cards. Then have the child sort the cards in matching pairs and read each two-digit numeral and expanded numeral.

2. The child may show a set of blocks for each row of panel 1, page 52.

3. Prepare 20 pairs of cards. For each pair show a two-digit numeral and an expanded form. Example:

20 + 3	23
30 + 2	32

Let two children play a card game. Shuffle the 40 cards. Each child is dealt 5 cards. The remaining cards are used for drawing. Children take turns drawing from the deck to get a match. As pairs are matched, they are put on the side. The first child to get five matching pairs wins. Cards pulled from the deck may be used to replace a holding card during a draw. But once a card is put into the discard pile, it cannot be used.

4. Two children may play the Computer Game. The input child says something like "5 tens plus 3 ones" or "5 tens plus 3." The output child writes or says "53."

5. The child may show a set of ten-boxes and blocks and give another expanded numeral for each number in panel 4, page 52.

RELATED AIDS

ACT. MASTERS—4.
—Seasonal 6.
—Gen. Use 3.

OBJECTIVES

To show the order of numbers through 100

To write missing numerals in a sequence

PACING

Level A All
Level B All
Level C All

MATERIALS

numeral cards for 1 through 99

SUGGESTIONS

The child may use the completed chart on page 53 as a reference in following lessons.

Initial Activities 1. Show a pack of numeral cards for 28 through 37 arranged in random order. Have the child arrange the numeral cards in order. The child then writes the next ten numerals. Repeat the activity using a pack of numeral cards for 74 through 83.

2. Write sequences of numbers such as: 18 ___ ___ ___ 22. Challenge the child to fill in the blanks. Make it clear that the child must count by ones.

Proceed until the child tires of this activity. The range of numbers for each "game" should be: 28-32, 38-42, 48-52, 58-62, 68-72, 78-82, and 88-92.

At some point have the child use blocks to test the understanding of the "one more" idea when counting.

RELATED AIDS

ACT. MASTERS—4.
—Gen. Use 3.
BFA COMP LAB I—20.

Counting

Write the numerals from 1 through 100.

			4	5	6	7	8	9	10
	12	13	14	15	16	17	18	19	20
21	22	23	24		26	27	28	29	30
31		33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53		55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76		78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	

Counting and writing numerals through 100 (fifty-three) 5

Using the Book Assist the child with as few rows as possible. However, it is important that the child understands the pattern before working alone. Ask the child to write the numerals in order from one through ten in the first row. Ask, "What number comes just aften ten?" Then have the child begin with 11 in the second row and continue until the page is completed.

You may challenge your better children to look for patterns on this number page. The following are listed for your convenience.

1. For any row, each number is one more than the number just before it and one less than the next number to the right.
2. For any row, the numeral in the tens place is the same (except for the last number).
3. For any column, the ones are all the same.
4. For any column, each number is 10 less than the next number below.

Treasure Hunt

1. Add or subtract.

5 − 5	0		6 − 5	1	
6 − 4	2		7 − 4	3	
2 + 2	4		7 − 2	5	
3 + 3	6		1 + 6	7	

2. Cut out the puzzle below.

Using the Book This is a cut and paste activity for addition and subtraction, sums 7 and less.

Panel 1: First have the child find the sums and differences in each rectangle.

Panel 2: Provide the child with a card (20 cm x 25 cm). Have the child cut out each part of the puzzle and put it together to find the picture of the treasure. There should be 8 parts, numbered 0 through 7. Each part is to be pasted on the card arranged in the order of the numbers in each rectangle in panel 1. That is, have the child find the part for 5 − 5, which is numbered 0, and paste it in the upper left corner of the card, and then find the part for 6 − 5, which is 1, and paste it to the right of the first part, and so on. The picture shows a pirate with a treasure chest.

OBJECTIVE

To practice adding and subtracting sum 7 or less

PACING

Level A All
Level B All
Level C All

MATERIALS

addition and subtraction practice cards

SUGGESTIONS

Initial Activities 1. Display, in a random order, the following addition and subtraction practice cards (horizontal or vertical form): 6 - 6, 5 - 4, 2 + 0, 1 + 2, 7 - 3, 3 + 2, 2 + 4, 4 + 3. Have the child arrange the cards on the chalkrail so that the answers for the additions and subtractions show the order of the numbers 0 through 7.

2. You may give the child other addition and subtraction practice cards, sum 7 or less. The child places each card on the chalkrail with the card in the sequence that has the same answer.

ACTIVITIES

1. Adapt the game Zip Up described in the Activity Reservoir. Two children may play the game using the addition and subtraction practice cards, sum 7 or less. Stack the practice cards. The game is to see which child can give more sums and differences in a specified time, such as 30 s.

2. Adapt the Domino Game in the Activity Reservoir for sum 7.

3. Two children may play a variation of the game Battle, described in the Activity Reservoir. Use a stack of addition and subtraction practice cards. Give each child half of the stack, face down. Each child turns over one card at a time. The child with the greater answer wins both cards.

OBJECTIVE

To name the number just after and just before a given number

PACING

Level A	All (1–3 first 3 guided)
Level B	All (1–3 first 3 guided)
Level C	All

MATERIALS

numeral cards for 1 through 100

SUGGESTIONS

Initial Activity Group the children for an activity. Use a pack of numeral cards from 35 to 44, in random order. Give one card to each child. Set up three chairs and choose one child to sit in the middle chair. When that child holds up his or her numeral card, the children with the numbers that come "just after" and "just before" must sit in the appropriate chairs.

ACTIVITIES

1. Give the child a worksheet with numerals in a column as in panel 3, page 55. Tell the child to give the numbers that come just before and just after each given number.

2. Provide a container with 47 buttons. Have the child guess the number of buttons. Then ask the child to count the buttons.

3. Have the child open the book so that pages 68 and 69 are showing. Ask the child to give the number that comes just before 68 and just after 69. The child may check the answers by looking on the appropriate pages.

4. Have the child open the book to page 69, hold this page, and turn to page 92. Challenge the child to guess and then count the number of lesson pages in Chapter 5 beginning with page 69 through page 92. (24 pages)

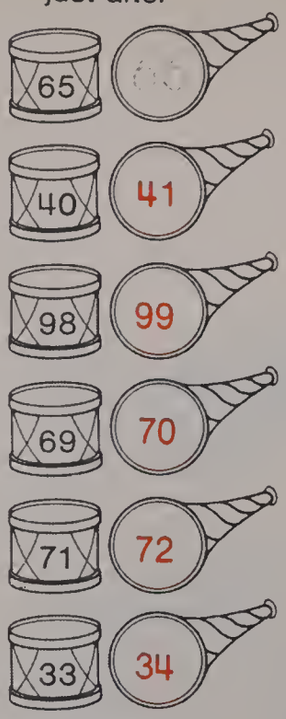
RELATED AIDS

ACT. MASTERS—5.
—Gen. Use 3.
BFA COMP LAB I—2, 3.

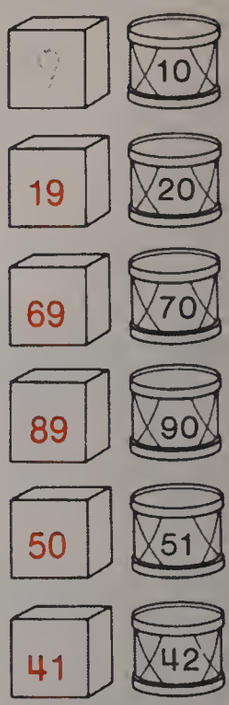
After and Before

Write the missing numerals.

1. just after



2. just before



3. Write the missing numerals before and after.

8	9	10		9	10	11
18	19	20		39	40	41
38	39	40		59	60	61
55	56	57		98	99	100

Using the Book Panel 1: Have the child write on each blue horn the number that comes just after the number on the drum. You may ask the child to tell how that number is found.

Panel 2: Have the child write in each blue box the number that comes just before the number on the drum. You may ask the child to tell why that number was chosen.

Panel 3: Have the child write, on the left, the number that comes just before and, on the right, the number that comes just after the number in the center of each row.

Between

Write the missing numerals.

1. 7 8 9	**2.** 9 10 11
17 18 19	19 20 21
27 28 29	29 30 31
3. 58 59 60	**4.** 35 36 37
49 50 51	80 81 82
73 74 75	79 80 81
60 61 62	97 98 99
5. 12 13 14 15	19 20 21 22
37 38 39 40	50 51 52 53
69 70 71 72	71 72 73 74
90 91 92 93	27 28 29 30
43 44 45 46	97 98 99 100

56 (fifty-six) Concept of the number between

Using the Book Ask the child to describe the picture at the top of the page. Ask, "What do you see between the two goats? (a scarecrow)" Ask the child to read the numerals from left to right. Ask, "What number comes between five and seven when counting? (6)"

If necessary, the child may use the numeral chart on page 53 as a reference for the following exercises.

Panels 1-4: For each row, have the child write the number that comes between the two given numbers.

Panels 5: For each row, have the child write the two numbers that come between the two given numbers.

OBJECTIVE

To give the number (or numbers) that comes between two given numbers when counting

PACING

Level A All (1 guided)
Level B All (1 guided)
Level C All

MATERIALS

numeral cards for 0 through 100

SUGGESTIONS

Initial Activity Give the child a pack of numeral cards for 46 through 55. Have the child arrange them in order. Ask, "What number comes between 48 and 50? (49) Between 51 and 53? (52)" Then ask, "What numbers come between 46 and 49? (47, 48) Between 49 and 52? (50, 51)"

ACTIVITIES

1. Adapt the game Zip Up described in the Activity Reservoir. Each child begins with 10 and counts as far as possible in 10 to 15 s.

2. The child might enjoy playing Computer. Have the child pretend to be a computer. Give the child two numbers such as 69 and 72. The child then gives the numbers that come between 69 and 72.

3. Tell the child to write the numerals, in order, for the numbers between 58 and 73. The child then finds page 58 in the book and checks the written sequence with the pages in the book.

4. Have the child play a relay game called "Tightrope." On 5 large sheets glued together (or on the chalkboard), duplicate for two teams similar numbers such as: 40 41 ___ ___ ___ . . . ___ 61 ___ 63 etc. Include 2 poles to hold the tightrope where the sequence of numbers begins and ends. Each team member takes turns filling in a blank (walking the tightrope). The first team to complete the tightrope correctly wins.

RELATED AIDS

ACT. MASTERS—5.
—Gen. Use 3.
BFA COMP LAB I—2, 3.

OBJECTIVE

To compare numbers less than 100, using the place value concept

PACING

Level A All (1-2 guided)
Level B All (1-2 guided)
Level C All (1-2 guided)

MATERIALS

9 full ten-boxes, 9 blocks

BACKGROUND

See Item 2 of the Chapter Overview Background.

SUGGESTIONS

Initial Activity Using blocks, show 38 and 42. The child writes the two-digit numerals. By comparing the sets of blocks, develop the idea that the number with more tens is the greater number. Write:

38 ◯ 42 42 ◯ 38

Have the child write > or < to make true sentences.

Repeat, using 32 blocks and 38 blocks. Develop the idea that when two numbers have the same tens, the number with more ones is greater.

ACTIVITIES

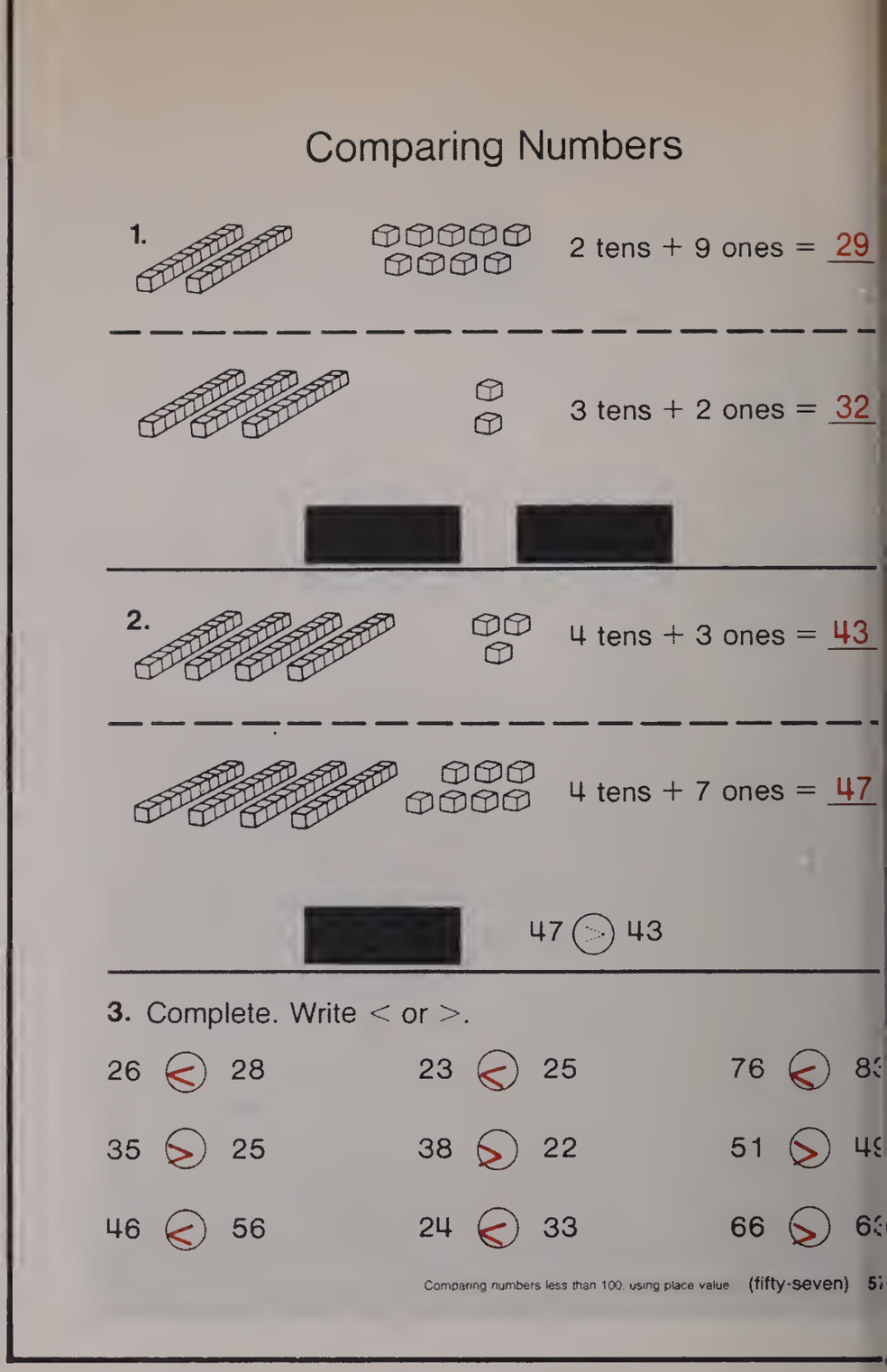
1. Two children may practice making true sentences similar to those in panel 3 by using numeral cards for numbers between 10 and 99 and a card for each of the signs > and <.

2. The child might enjoy the game Battle in the Activity Reservoir.

3. Play the game Guess – Give or Take described in the Activity Reservoir.

RELATED AIDS

ACT. MASTERS—4, 6, 7.
—Seasonal 6.
—Gen. Use 3.



Using the Book Panel 1: Ask, "How many blue ten-boxes? (2) How many blue blocks? (9)" Then have the child read the expanded numeral and write the two-digit numeral. Ask, "How many red ten-boxes? (3) How many red blocks? (2)" Then have the child read the expanded numeral and write the two-digit numeral. Ask, "Which set has more ten-boxes? (red) Which numeral, 29 or 32, shows more tens? (32) Which number is less, 29 or 32? (29)" Have the child read the sentences at the bottom of the panel and trace the "is greater than" and "is less than" signs.

Panel 2: Proceed similarly to the first part suggested for panel 1. After the two-digit numerals have been written, ask, "Do the two sets (red and yellow) have the same number of ten-boxes? (yes) Which set has more blocks? (yellow) Do the numerals 43 and 47 show the same tens? (yes) Which numeral shows more ones? (47) Which number is greater, 43 or 47? (47)" Have the child read the two sentences at the bottom of the panel and trace the < and > signs.

Panel 3: Have the child write > or < to make true sentences.

Comparing Numbers

49 ◯ 45 47 ◯ 51

2. Complete. Write > or <.

17 ◯ 13	44 < 51
12 > 8	59 < 60
35 < 53	36 > 29
19 < 81	7 < 13
70 > 60	78 < 83
96 > 95	16 > 12
39 < 50	84 > 81

3. 23 < 28	**4.** 92 > 67
28 < 31	67 > 58
23 < 31	92 > 58

Using the Book Panel 1: Ask the child to read the numerals on the houses. Then ask the child to count from 44 to 53 without looking at the page. You may write 49 ○ 45 on the chalkboard. Ask "Which number comes first when counting, 49 or 45? (45) Then, which number is greater 45 or 49? (49)" Ask a child to go to the board and write > or < in the ring to make a true sentence. On the page, have the child read 49 > 45 and trace the sign >. Then have the child read the other sentence in panel 1. Ask, "Which number comes first when counting, 47 or 51? (47)" Have the child trace the sign <.

Panels 2-4: Have the child write > or < in each ring to make a true sentence.

You may give the better students a puzzle. Have them study the patterns in panels 3 and 4. Then tell them a story something like this: "Anne's number is less than Jane's number. Jane's number is less than Henry's number. How do Anne's number and Henry's number compare?"

OBJECTIVE

To compare numbers less than 100, using the counting sequence

PACING

Level A	All (1 guided)
Level B	All (1 guided)
Level C	All (1 guided)

MATERIALS

9 full ten-boxes, 9 blocks

BACKGROUND

See Item 2 of the Chapter Overview Background.

SUGGESTIONS

Initial Activity Display sets of 24 and 32 blocks. Have the child count the blocks in each set. Ask, "Which set has less blocks? Which number is less? Which number comes first when counting? Which number is greater?" Write:

24 ◯ 32 32 ◯ 24

Have the child write the signs > and < to make true sentences.

ACTIVITIES

1. Play Battle in the Activity Reservoir. Use numbers 10 through 99.

2. Have the child practice making true sentences similar to those in panel 2. Use flannel or magnetic board numbers 10-99 and strips for signs > or <.

3. Ask the child to study the patterns in panels 3 and 4 and tell how the third sentence in each panel is related to the first two. (Blocks may be used to illustrate that since 23 < 28, and 28 < 31, then 23 < 31.)

RELATED AIDS

ACT. MASTERS—4, 6, 7.
—Seasonal 6.
—Gen. Use 3.

OBJECTIVE

To count by fives

PACING

Level A All (1 guided)
Level B All (1 guided)
Level C All (1 guided)

VOCABULARY

fives

MATERIALS

plastic spoons (20 of one color, 5 of another color)

SUGGESTIONS

Initial Activity Give the child 25 plastic spoons (20 of one color, 5 of a contrasting color). Have the child arrange them so every 5th spoon is of the contrasting color. Then the child counts them by fives, writes the numerals 1-25 and rings the numeral for each contrasting spoon.

ACTIVITIES

1. Provide the child with 19 blank index cards. Have the child construct set cards with 5 dots on each card. Then have the child place the cards on the chalk rail and count the dots by fives.

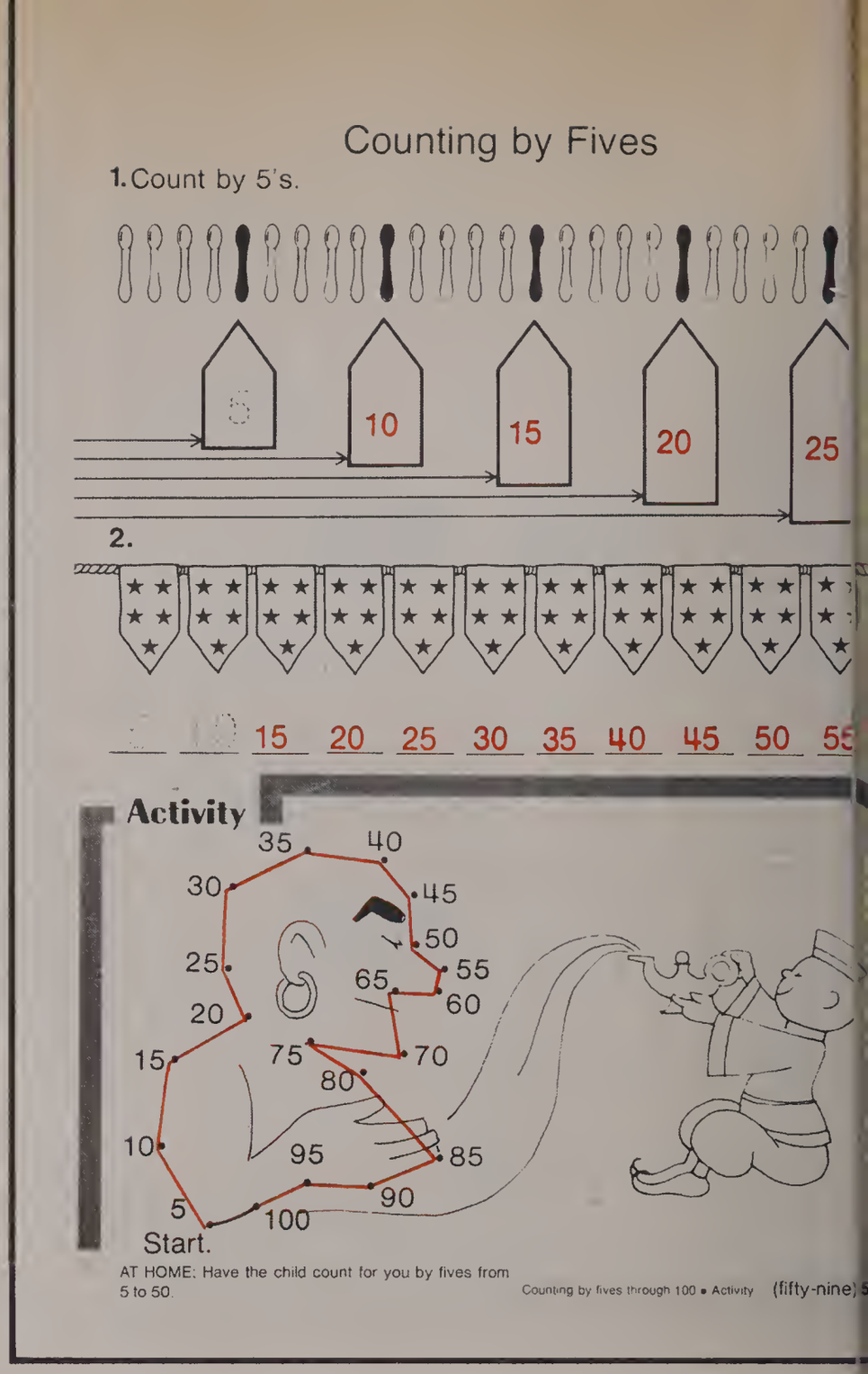
2. The child may use the numeral chart constructed on page 53. Have the child use buttons and cover the numerals of the numbers used when counting by fives. The child begins with 5.

3. You may wish to read the story of Aladdin after the child has completed the dot picture.

4. Distribute numeral cards for 5, 10, 15, . . . , 95 (counting by fives). Some children may have more than one card. Then play the game Pop Up in the Activity Reservoir.

RELATED AIDS

ACT. MASTERS—8, 11.
BFA COMP LAB I—26.



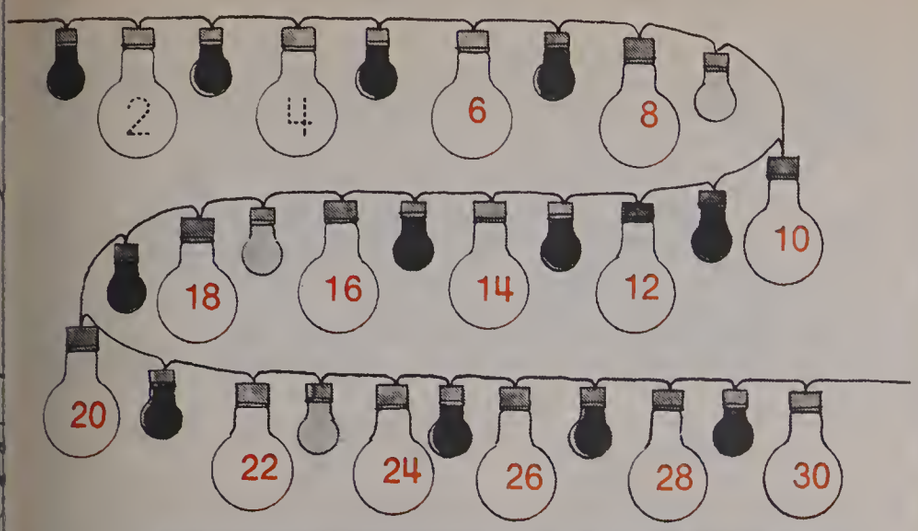
Using the Book Panel 1: Have the child count the spoons, silently for yello aloud for any other color. Have the child write the number of each red or blu spoon in the arrow. Then have the child read these numerals from left to righ

Panel 2: Have the child write the numerals to show counting by fives. The child may count the stars if necessary.

Activity: Have the child start at 5 and connect the dots by counting by fives to 100. When finished, the child may color the picture of the genie.

At Home After finishing the pupil page, the child may take it home and co plete the At Home activity printed in blue at the bottom of the page.

Counting by Twos



Activity

Odds and Evens

Count by 2's. Colour them red.
Reds — even numbers. Others — odd.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

Even — red. Odd — blue.

51	52	53	54	55	56	57	58	59	60

 AT HOME: Have the child count for you by two to 50.

Using the Book Top of page: Have the child count the light bulbs by twos and write the numerals on the large yellow light bulbs.

When the child has completed this panel, you may have the child read the numerals 2 through 30 written on the yellow light bulbs.

Activity: Have the child count by twos from 2 to 30 and mark in red all the numbers (even numbers) that have been counted. When the child has counted in red the even numbers from 2 to 30, discuss the method of distinguishing even numbers (end in 0, 2, 4, 6, 8) and then colour the even numbers blue from 51 through 60.

OBJECTIVES

To count by twos
To identify odd and even numbers

PACING

Level A	All (1 guided)
Level B	All (1 guided)
Level C	All (1 guided)

VOCABULARY

twos
odd
even

SUGGESTIONS

Initial Activity Give the child 30 buttons and have the child find out how many there are. Ask the child to think of a way besides "ones" and "fives" to count. Then have the child count by twos and you write the numerals as the child counts.

ACTIVITIES

1. Have available numeral cards for 1-90. Invite the child to begin with 10 and show numeral cards used when counting by twos through 30. Repeat the activity for 50 through 70.

2. Distribute numeral cards for 2, 4, 6, . . . , 98 and play Pop Up as described in the Activity Reservoir. Some children may hold 3 or 4 cards.

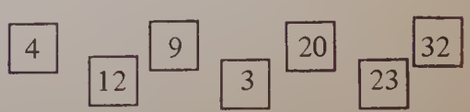
3. Have the child begin with 2 and use buttons to cover the numerals used when counting by twos through 100. The chart on page 53 may be used.

4. Challenge the child to begin with 3 and count by twos to 25. The chart on page 53 may be used.

5. Encourage the child to tell you things that come in twos (eyes, shoes, socks, for example). Ask, "How many shoes are needed for 15 children?"

EXTRA PRACTICE

To practice identifying odd and even numbers, you may make a set of stepping stones (use 25 cm square cards) putting one number on each card. Place the cards on the floor in any order



The child hops on both feet from one even (odd) numbered card, landing once on each even (odd) numbered card.

RELATED AIDS

ACT. MASTERS—9-11.
BFA COMP LAB I—25.

OBJECTIVE

To solve problems related to graphs

PACING

Level A (Initial Activities only)
Level B All (1, 3 guided)
Level C All (1 guided)

MATERIALS

bar graphs from the worktable

SUGGESTIONS

Initial Activities 1. Have the child find bar graphs on the worktable (or graphs used in Chapter 2). The child may describe a graph and make up a story about it. Ask questions related to the graphs being described. Children should be able to answer questions such as "How many?" from the graphed data.

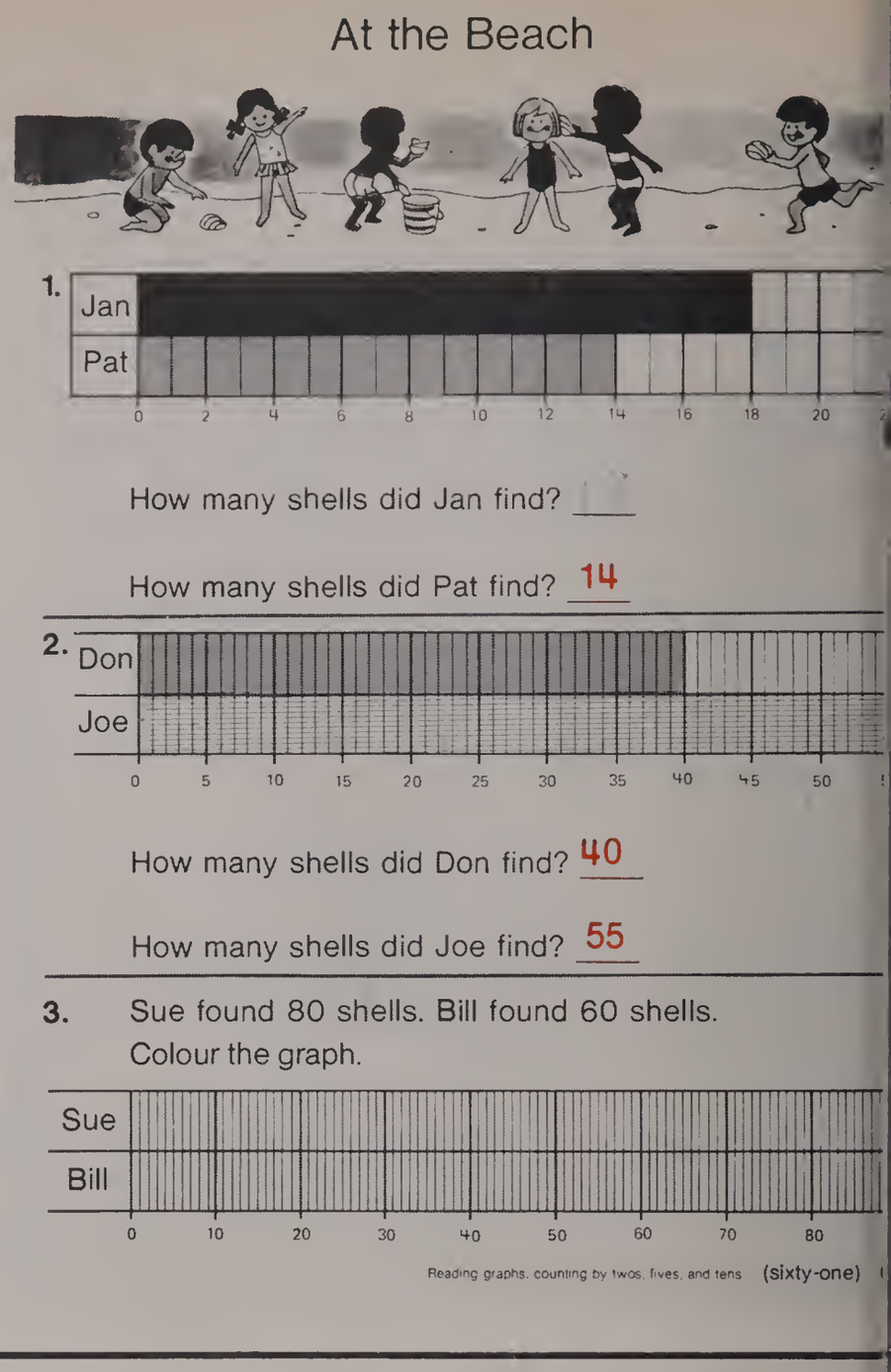
2. You may wish to read a story about the beach or show pictures of shells. It might be stimulating for the child to observe and manipulate real shells. Encourage the child to tell of his or her own beach experiences.

ACTIVITIES

1. Use the chart that the child constructed on page 53 (the numeral chart) or lesson page 53. Have the child include yellow construction paper disks to show counting by twos and red disks to show counting by fives. Then challenge the child to use pointers to count by twos and then by fives.

2. Have children count by twos using the game Zip Up. See the Activity Reservoir.

3. Challenge the child to assemble 100 blocks and count the blocks by tens as he or she works. (Vary by counting by twos and fives.)

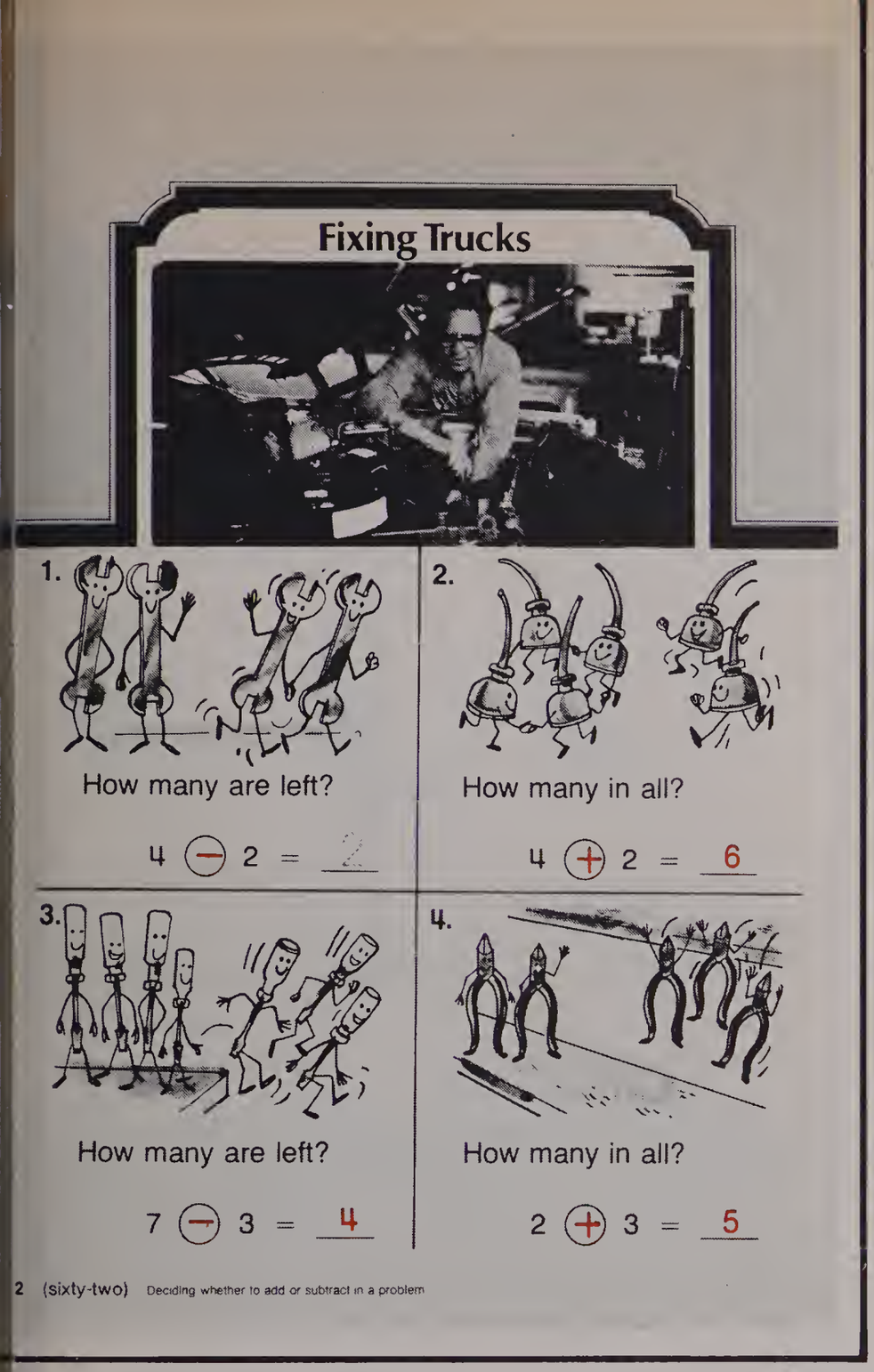


Using the Book Have the child describe the picture at the top of the page. Elicit that the children are looking for sea shells.

Panel 1: Tell the child the graph shows how many sea shells Jan and Pat found. Remind the child that each colored box stands for one shell. Point out that the number line shows twos. Assist the child in reading each question. Have the child write the answer in the blank next to the question. Encourage the child to use the numerals along the number line in each panel to find the answers.

Panel 2: Have the child write the number of shells Don and Joe found. Point out that the number line shows fives.

Panel 3: Assist the child in reading the sentences. Explain that there are ten frames inside each box made by heavy blue lines. Have the child color 80 frames for Sue and 60 frames for Bill.



Using the Book The child may first describe the picture and tell about experiences, if any, in a garage. (See Career Awareness in Chapter Overview.)

Panels 1–4: Tell the child to describe the picture, then read the question and complete the sentence to find the answer to the question. A description of each panel is given.

Panel 1: Two wrenches are standing around and two are leaving. (4 - 2 = 2)

Panel 2: Four oil cans are dancing around and two more are running to join them. (4 + 2 = 6)

Panel 3: Four screwdrivers are on a table and three are jumping off the table. (7 - 3 = 4)

Panel 4: Two wire cutters are on a shelf. Three are jumping from another shelf to join them. (2 + 3 = 5)

OBJECTIVE

To complete a number sentence to solve a pictured problem

PACING

Level A	All (1-3 guided)
Level B	All (1-2 guided)
Level C	All (1 guided)

Initial Activity Dramatize story problems. Write 6 ○ 1 = ___. Send six children to the chalkboard to draw pictures. Ask, "How many children are drawing pictures? (6)" Ask one child to sit. Ask, "How many children are left at the chalkboard? (5)" Then complete the sentence to go with the activity and adapt the activity to go with the completed sentence: 6 ⊖ 1 = 5.

This is a career page. Before discussing the page, you may want to identify any children in the class whose parents or parent are truck mechanics. If such children are in your class, let them report on the duties of mechanics and how their job involves people. Then explain something about the scope of such mechanics. (See Chapter Overview.)

ACTIVITIES

1. Select children from each group below to assemble the cutouts for a bulletin board or classroom display.

2. Have children cut out pictures (from magazines, catalogues, or newspapers) of cars, trucks, or buses requiring auto mechanics.

3. Have children cut out pictures (use sources listed above) of tools used by auto mechanics—auto parts, etc.

4. Have children find and cut out pictures of mechanics at work.

5. Challenge children to make up story problems (similar to the ones on page 62) from pictures collected.

OBJECTIVE

To tell time to the hour and half hour

PACING

Level A	All (pnl 1-3 guided)
Level B	All (pnl 1-3 guided)
Level C	All (pnl 1-3 guided)

VOCABULARY

hour, half hour

MATERIALS

demonstration clockface, a coloured semi-circular region to cover one half of the clockface

BACKGROUND

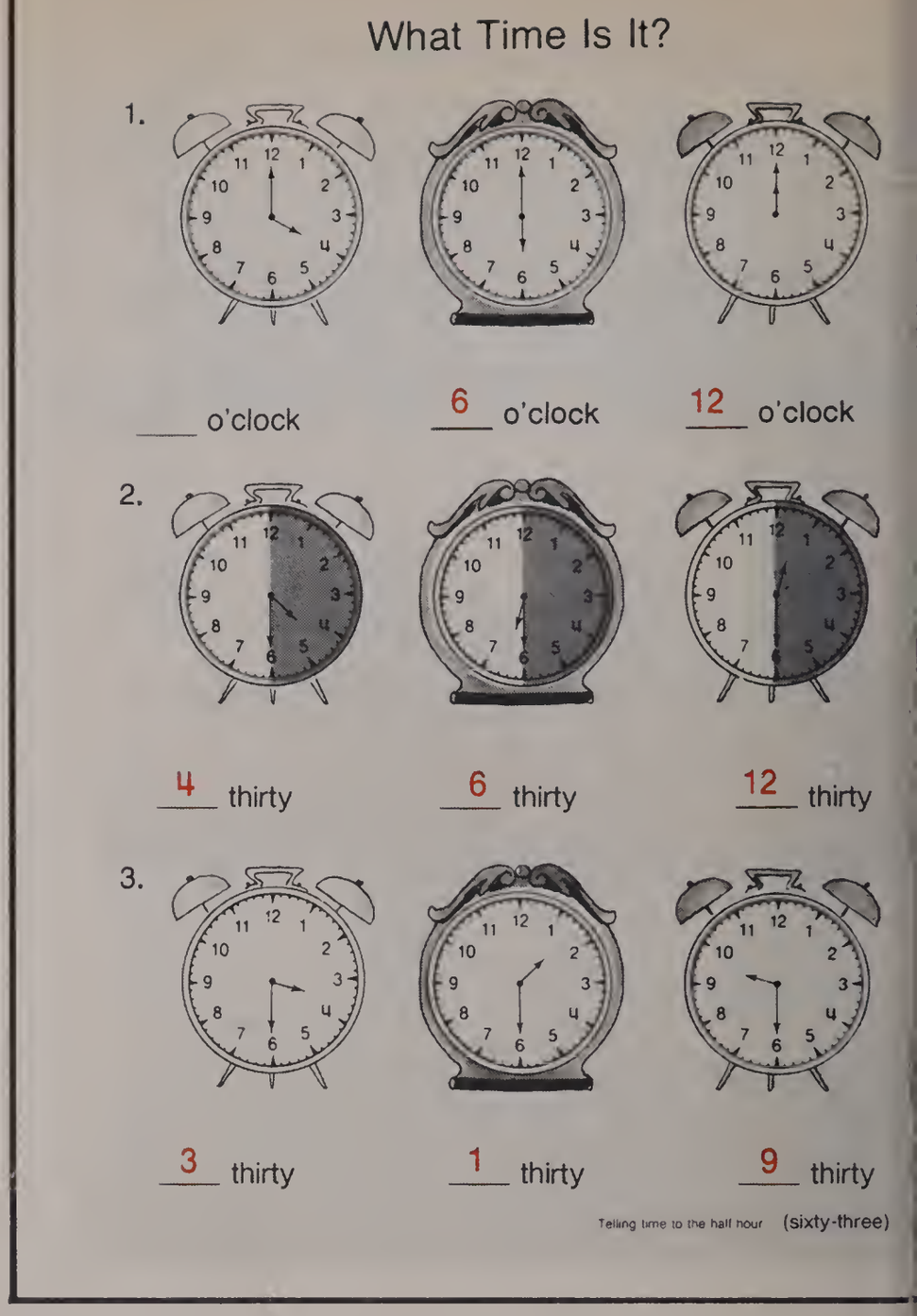
See Item 2 of the Unit Overview Background.

SUGGESTIONS

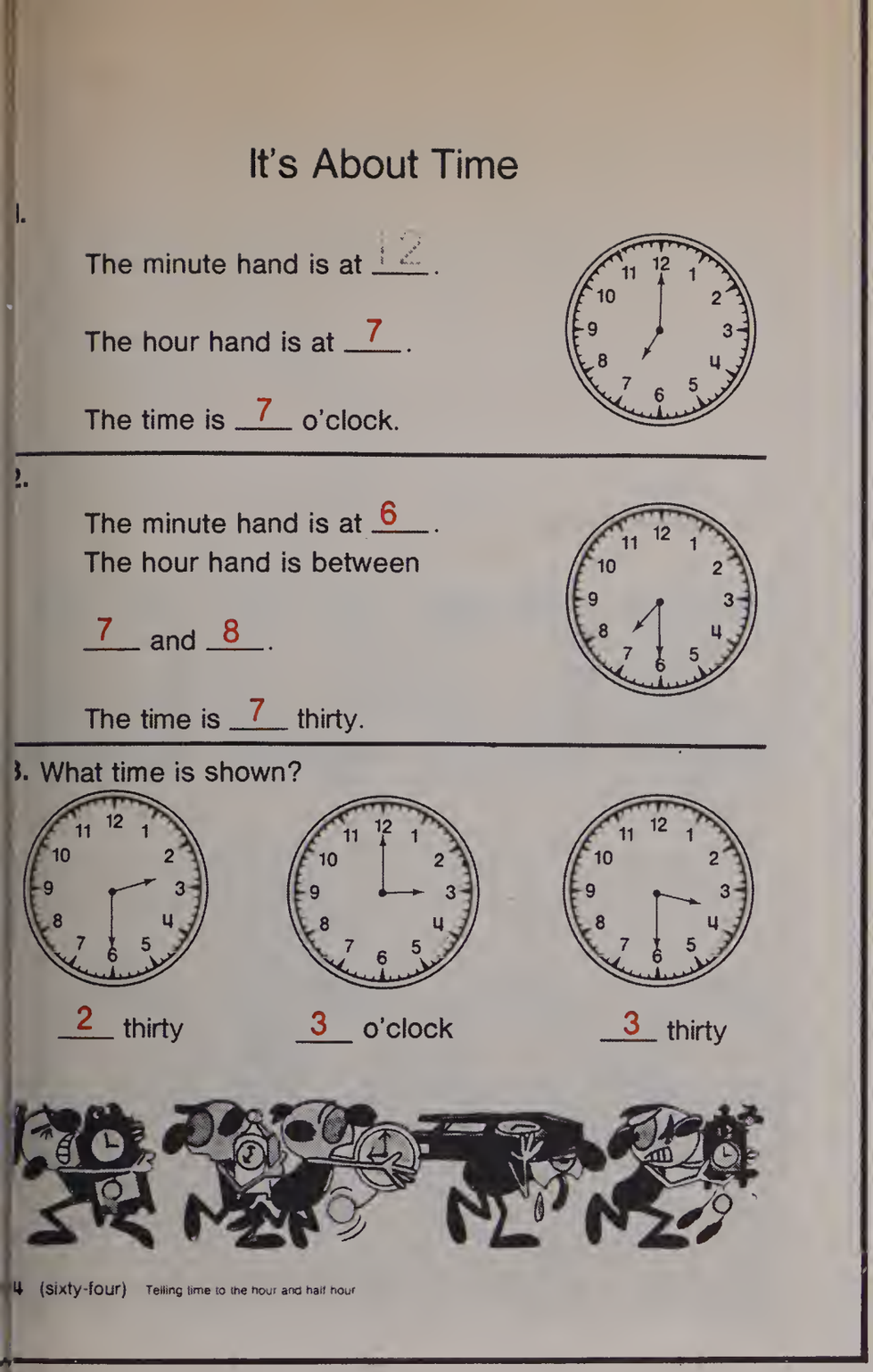
Initial Activities On the demonstration clockface show 9 o'clock and write the time "9 o'clock," below the clockface. Place the coloured semi-circular region over the right half of the clockface and elicit from the child that one half of the clockface is covered. Explain that when the long (minute) hand goes from the numeral 12 to the numeral 6 (demonstrate), or halfway around the clockface, we say it is "thirty minutes after the hour." Point out that the short (hour) hand has moved part of the way from 9 to 10. Then record the time as "nine-thirty."

RELATED AIDS

ACT. MASTERS—12.



Using the Book Panels 1-3: Compare the clockface that shows the time on the hour and the one below it that shows the half hour. Discuss the position of the hands of the clock when the time is on the hour. Then direct attention to the clockface showing the half hour. Elicit that one half of the clockface is shaded. Stress that when the long (minute) hand goes from the numeral 12 to the numeral 6, halfway around the clockface, we say it is thirty minutes after the hour.



Using the Book Panel 1: Have the child look at the clockface. Then assist the child in reading and completing the sentences.

Panel 2: Have the child complete the sentences. Then, ask the child to read the last sentence.

Panel 3: The clockfaces show a sequence of time from 2:30 to 3:30. Have the child look at each clockface and fill in the blank below it.

OBJECTIVE

To tell the time to the hour and half hour

PACING

Level A	All (pnl 1-3 guided)
Level B	All (pnl 1-2 guided)
Level C	All (pnl 1-2 guided)

VOCABULARY

o'clock, minute, hour, minute hand, between

MATERIALS

demonstration clock

BACKGROUND

See Item 3 of the Chapter Overview Background.

SUGGESTIONS

Initial Activities 1. Using a transparency clock, have the child identify the minute hand and the hour hand. Be sure the child knows which way the hands move around the face of the clock.

By experimenting with the clock, the child may find: (a) which hand moves faster, (b) when the minute hand points to 12, the hour hand points to one of the numerals 1 through 12, and (c) the minute hand moves all the way around the face while the hour hand moves from one numeral to the next.

2. Ask, "How long does it take the hour hand to move from one numeral to the next numeral? (an hour) How long does it take the minute hand to go all the way around the face of the clock? (an hour)" Demonstrate using the clockface.

ACTIVITIES

The child should have frequent opportunities to tell the time on the school clock on the hour and half hour.

RELATED AIDS

ACT. MASTERS—12.

OBJECTIVE

To practice telling time to the hour and half hour

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

Initial Activities 1. Ask, "How long does it take the minute hand to move from 12 to 6?" (30 min) Say, "When the minute hand is at 6, it is always 30 min after the number the hour hand has just passed."

2. Show 2:00. Call attention to the positions of the hands. Ask the child, "Which is longer, the minute or the hour hand? Where does the hour hand point? Where does the minute hand point?" If the child does not know, explain. Then write the time shown:

2 o'clock

Then show 3:00 to demonstrate that the minute hand has moved all the way around when it points to 12 again. Write: 3 o'clock. Do the same for 4:00, 6:00, 10:00, and 12:00. Have the child give the time for each setting.

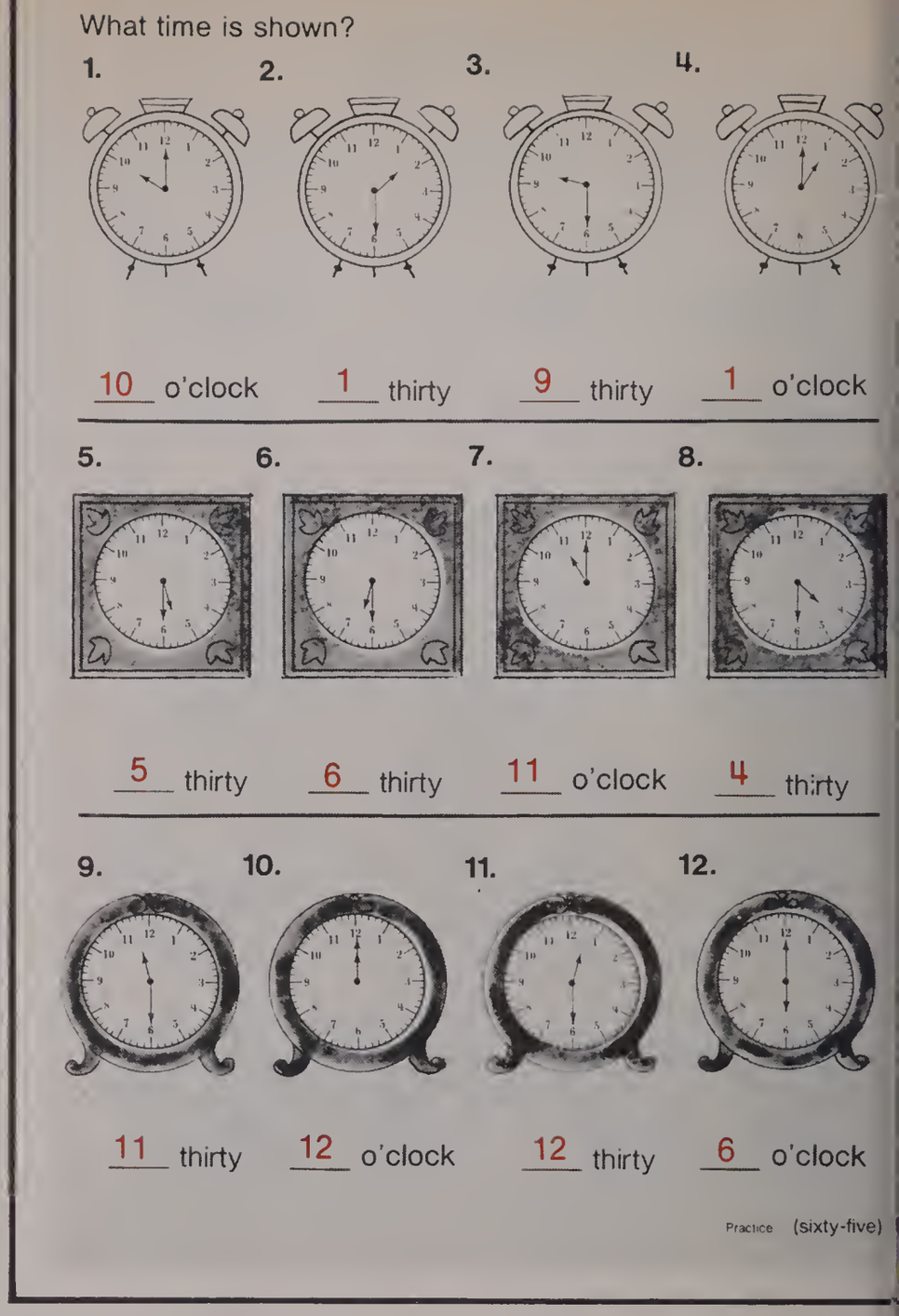
3. Show 3:30. Have the child give the time. Develop the idea that the minute hand has moved only halfway around when it points to the 6. Then the hour hand is past 3 so the time is three thirty. Write: 3 . Have the child tell the time at each hour and half hour.

ACTIVITIES

1. The child should have frequent opportunities to tell the time on the school clock on the hour and half hour.

2. Allow children opportunities to manipulate the demonstration clock. Have one child name a time (hour and half hour), then have another child show the time on the clockface. Alternate the activity so each child can manipulate the clockface.

3. Call attention to the clockfaces in panels 1 through 4 on page 65. Ask the child to tell the time it would be one hour later for each clockface. Then ask the child to tell the time it was one hour ago for each clockface.

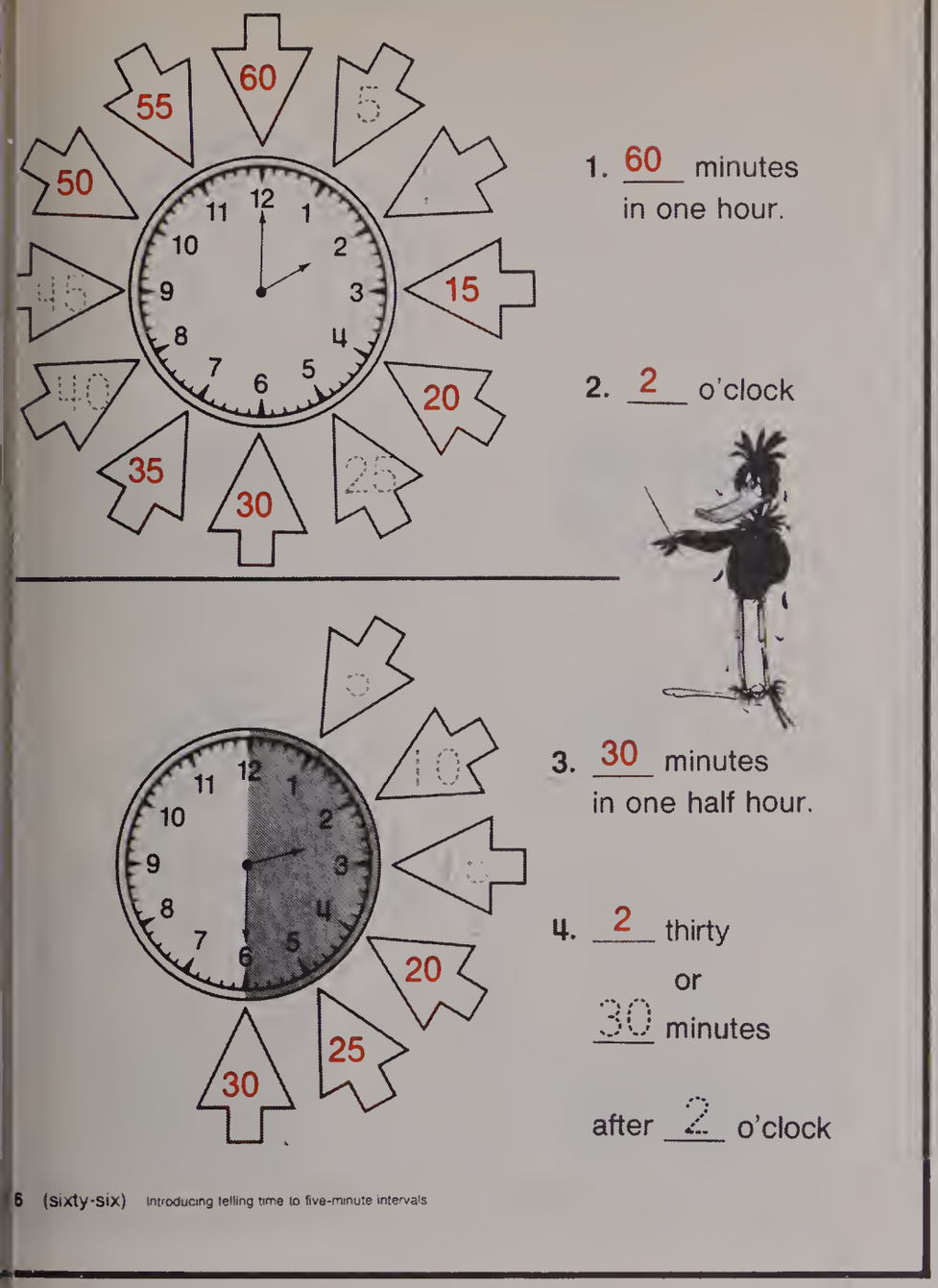


Using the Book Panels 1-12: For each panel, have the child write the numer in the blank to tell the time shown on the clockface.

Ask the child to look at all of the clocks on this page. Say, "There are two different numbers to which the long hands are pointing. What are the two numbers? (12 and 6) When the long hand is pointing to the 12, what kind of time is shown? (a whole hour) When the long hand is pointing to the 6, what kind of time is shown? (half past an hour or halfway between two whole hour

RELATED AIDS

ACT. MASTERS—12.



Using the Book Panels 1-12: For each panel, have the child write the numeral in the blank to tell the time shown on the clockface.

Ask the child to look at all of the clocks on this page. Say, "There are two different numbers to which the long hands are pointing. What are the two numbers? (12 and 6) When the long hand is pointing to the 12, what kind of time is shown? (a whole hour) When the long hand is pointing to the 6, what kind of time is shown? (half past an hour or halfway between two whole hours)"

Bottom of page: Have the child count by fives and write the numerals in the arrowheads to find how many minutes in half an hour. Then have the child complete Exercise 3. Then ask, "How many minutes after 2 does the clock show? (30) What time does the clock show? (two thirty)" Have the child complete Exercise 4 and read it aloud.

OBJECTIVE

To tell time at five-minute intervals up to 30 minutes past an hour

PACING

Level A	All (guided)
Level B	All (guided)
Level C	All (guided)

VOCABULARY

minutes, one half

MATERIALS

demonstration clock

SUGGESTIONS

Initial Activities 1. Using the demonstration clock, guide the child in discovering that (a) there are five spaces between each pair of numerals, (b) the minute hand takes one minute to move over one of these spaces, (c) the minute hand moves from one numeral to the next in five minutes.

2. Have the child count by fives to discover that there are 60 minutes in one hour and 30 minutes in one half hour. Develop 30 minutes after 2.

ACTIVITIES

1. Have the child manipulate the demonstration clock. Show 2 o'clock. Have the child move the minute hand and count the minutes by fives.

2. The child may make a demonstration clock. Have the child cut out a duplicated clockface. Provide cardboard, 2 strips of construction paper for the hands, and a flexible paper clip. Paste the clockface to the cardboard and insert the hands with the paper clips.

3. Construct activity 1 above.

RELATED AIDS

ACT. MASTERS—13, 14.

OBJECTIVE

To use the colon notation (7:15) to show the time (five-minute intervals)

PACING

Level A All (guided)
Level B All (guided)
Level C All (1-3 guided)

MATERIALS

demonstration clock

SUGGESTIONS

Initial Activities 1. Set the clock to show 8 o'clock. Have the child count the minutes by fives as you move the hands to show 8:30. Ask, "How many minutes is it after 8 o'clock?" Write: 30 minutes after 8 o'clock. Tell the child there is another way to show this time. Write 8:30. It is read as "eight-thirty."

2. Show 9:15 and 12:25. For each setting, have the child give the time two ways, for example: 15 minutes after 9 and 9:15.

ACTIVITIES

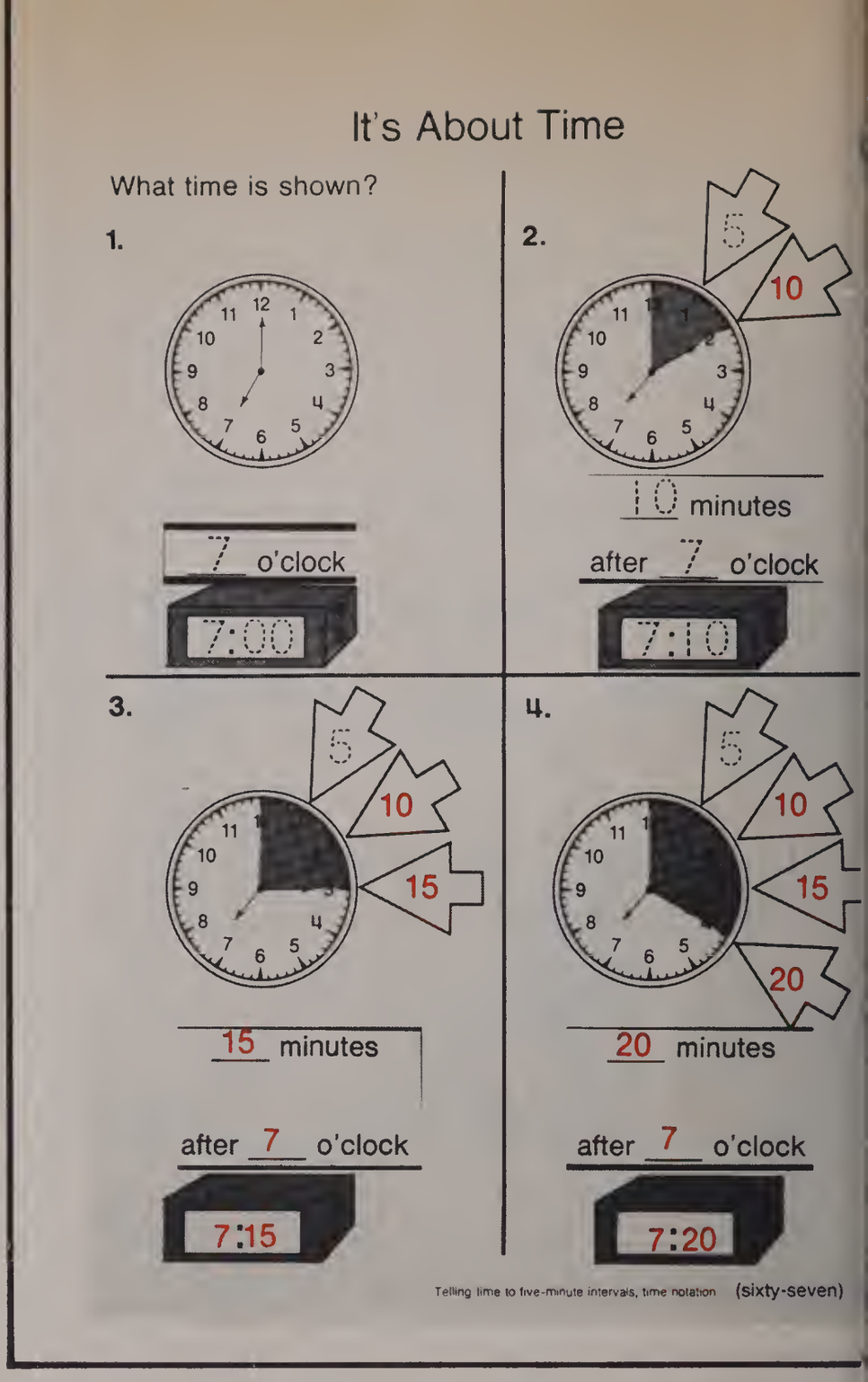
1. Have the child use the transparency clock or the clocks made on page 66 to show the times pictured on this page.

2. Involve the child in Bulletin Board suggestion 2 in the Chapter Overview.

3. Throughout each day you may ask the child to tell the time on the room clock for such times as 9:20, 10:25, 2:10, and so on.

RELATED AIDS

ACT. MASTERS—13, 14.



Using the Book Panel 1: Ask, "What time is shown? (7 o'clock)" Have the child write 7. Have the child point to the new notation for 7 o'clock. Elicit th the hour is shown before the two dots and the minutes after the hour are show after the two dots. Two 0's are written when there are no minutes after the hour. Then have the child trace 7:00.

Panel 2: Have the child write the numerals on the arrowheads and tell how many minutes the minute hand is past the hour. Then have the child trac and read each notation for the time and relate each to the positions of the han on the clockface.

Panels 3-4: For each panel, have the child first count the minutes after the hour, then write the numerals on the arrowheads. Then have the child complete both notations to tell the time on the digital clocks.

THINK!

Complete.

1. 6 tens + 8 = 68

   3 tens + 9 = 39

2. 90 + 8 = 98

   50 + 1 = 51

3. Write the missing numerals.

14	16	18	20	22	24	26	28	30
40	50	55	60	65	70	75	80	85
10	20	30	40	50	60	70	80	90
34	35	36	37	38	39	40	41	42

4. Complete. Write > or <.

39 < 52 | 11 > 8 | 64 < 67

70 > 40 | 59 < 72 | 93 > 78

What time is shown?

5. 6 thirty

6. 6 o'clock

7. 5:00

8. 9:05

sing the Book This is a diagnostic test. The page references are given for -teaching as needed.

Panels 1-2: Have the child write the numeral in each blank to make a ue sentence. [pages 48-52 B]

Panel 3: Tell the child, "For each row, look at the first three numbers, nd the pattern and then write the numerals in the blanks to follow the attern." [pages 47, 53, 59, 60 A, D]

Panel 4: Tell the child to write > or < in each ring to make a true ntence. [pages 57-58 C]

Panels 5-8: Tell the child to write the time for each clockface using e colon notation for panels 7 and 8. [pages 63-67 E]

OBJECTIVE

To evaluate achievement of the Chapter Objectives

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

The Chapter Test is designed to be used in a diagnostic manner. It assesses the child's knowledge of the main concepts and skills that were taught in this chapter. Some children should take this test independently with guidance for instructions only. Use judgment as to whether certain children should be guided through some or all of the exercises. Check each child's work and mark the items that are incorrect. Reteaching or extra practice might be necessary to help the child acquire the concept or skill that was missed. With this reteaching, you will be able to ascertain whether the child has then learned the topic in question. See Using the Book for page references indicating where the concept or skill was taught.

ACTIVITIES

1. The child may benefit by working with a demonstration clock to illustrate a particular time.

2. Practice counting by twos, fives, or tens with a game. Seat several children in a circle for this activity. Have one child begin the counting in a clockwise manner. The child whose turn it is to say 5 or a multiple of 5 says "buzz" instead. When a child utters the wrong number or forgets to say "buzz," that child starts another round of the game by saying "one."

3. Adapt the game Battle described in the Activity Reservoir.

CHAPTER 5 OVERVIEW

This chapter deals with basic addition and subtraction facts with sums 8 and 9. Subtraction is associated with two more types of physical situations: how many more are needed, and comparing two sets, i.e., how many more are in one set than another set? And the fractions one half, one third, and one fourth are introduced. The calendar is also presented.

OBJECTIVES

A To add and subtract, sums 8 and 9
B To solve problems
C To identify $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$ of pictures

VOCABULARY

calendar 73
days of the week 73
months of the year 73
halves 83
one half 84
thirds 85
one third 86
fourths 87
one fourth 88

BACKGROUND

1. The child encounters another physical situation with which subtraction may be associated. This situation involves comparing sets. For these problems we want to encourage the child to find how many members in each set and then subtract. (page 81)

2. Sentences such as

$$7 + 2 = 9 \qquad 9 - 2 = 7$$
$$2 + 7 = 9 \qquad 9 - 7 = 2$$

show an addition and subtraction family. These four sentences are all the addition and subtraction sentences with only the numbers 7, 2, and 9 in each sentence. Similarly, the vertical forms

$$\begin{array}{r} 7 \\ +2 \\ \hline 9 \end{array} \qquad \begin{array}{r} 9 \\ -2 \\ \hline 7 \end{array} \qquad \begin{array}{r} 2 \\ +7 \\ \hline 9 \end{array} \qquad \begin{array}{r} 9 \\ -7 \\ \hline 2 \end{array}$$

show an addition and subtraction family.

For each addition above, there is a subtraction that goes with it, for example:

$$7 + 2 = 9 \text{ and } 9 - 2 = 7$$

These two sentences are called related addition and subtraction sentences. Similarly,

$$\begin{array}{r} 7 \\ +2 \\ \hline \end{array} \qquad \begin{array}{r} 9 \\ -2 \\ \hline \end{array}$$

are related additions and subtractions.

MATERIALS

addition and subtraction practice cards
for sums through 9
9 full ten-boxes
18 blocks
red and blue chalk
red crayon
paper pie plates
calendar for the current year

CAREER AWARENESS

Day Care Center Workers [80]

Day care centers employ people who have some special training in the field of child day care. These include teachers, assistant teachers, nurses and secretaries. Some centers combine non-professional workers as well. These include aides, students, and in some cases volunteer workers. Other workers such as housekeepers, orderlies, cooks, and janitors help in the operation of the center.

Children who attend the centers range in age from infant to school age. Most day care centers are located near the child's home or the parent's job. This allows the parent to be reached in case of emergency.

At the center children are given meals and snacks. Most of the time is spent on indoor and outdoor recreation; individual and group activities, games, storytelling; arts and crafts; etc.

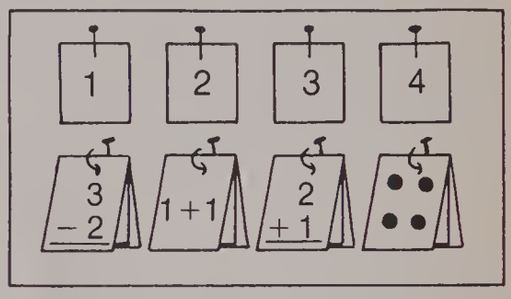
It is important that children develop an awareness of self and others. Day care center workers interact with children as well as parents. It is one of the many careers that relies solely on the interaction of people. Children interact with other children. Workers interact with children. Workers interact with parents.

Photo description: In this Day Care Center, preschool age children are cared for from 8 am until 6 pm. The Day Care Center worker has made play dough out of flour, salt, and water. The children are making different objects. After the objects are dry, the children will paint them.

BULLETIN BOARD

1. Have the children draw a street with 3 houses and several trees on it. On the roof of each house place a horizontal addition or subtraction practice card for sum 7, 8, or 9. Have 3 pockets on the house below the roof to represent 3 floors of the house. Use horizontal addition and subtraction practice cards for sums 7, 8 or 9. Challenge 3 children to each choose a house and show the other members of the family that live in that house by placing the related addition and subtraction sentences for the fact on the roof in the pockets.

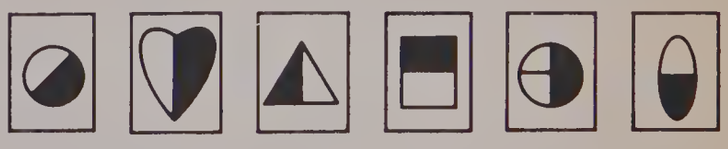
2. Prepare a Fact Board for sums through 9. On the bulletin board or cork board tack numeral cards 1 through 9. Put nails beneath each numeral card.



Assist the child in making addition and subtraction practice cards and set cards from sheets of paper cut into fourths. Punch holes at the top of each card. Have the child sort various combinations of addition and subtraction facts for each number. (Use for sums through 18.)

3. Select a leader for each of 3 groups. For each group, each child's name is written on a file card. From old calendars, they cut out the names of the months. The names of the children are shown in one set and the names of the months are shown in another set. Then, using string, each child's name is matched with the month of his or her birthday. Use this as a class activity.

4. Divide the bulletin board into three sections. Label the sections $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$. Using index cards make a set of six cards to illustrate each fraction. For example, $\frac{1}{2}$ may be:



(You might include a card for each fraction with the word name of the fraction on it.) Place all cards in a plastic bag and tack it to the bottom edge of the bulletin board. Challenge children to pick cards from the bag, decide which fraction it illustrates, and then tack it under the proper fractional numeral. Children might like to compete with each other for speed.

OBJECTIVE

To add, sums 8 and less

PACING

Level A	69 All (1-3 guided) 70 All
Level B	69 All (1-2 guided) 70 All
Level C	69 All (1 guided) 70 All

MATERIALS

8 blocks

SUGGESTIONS

Initial Activities 1. On the chalkboard write:

7 + 1 = ____ 8 - 1 = ____

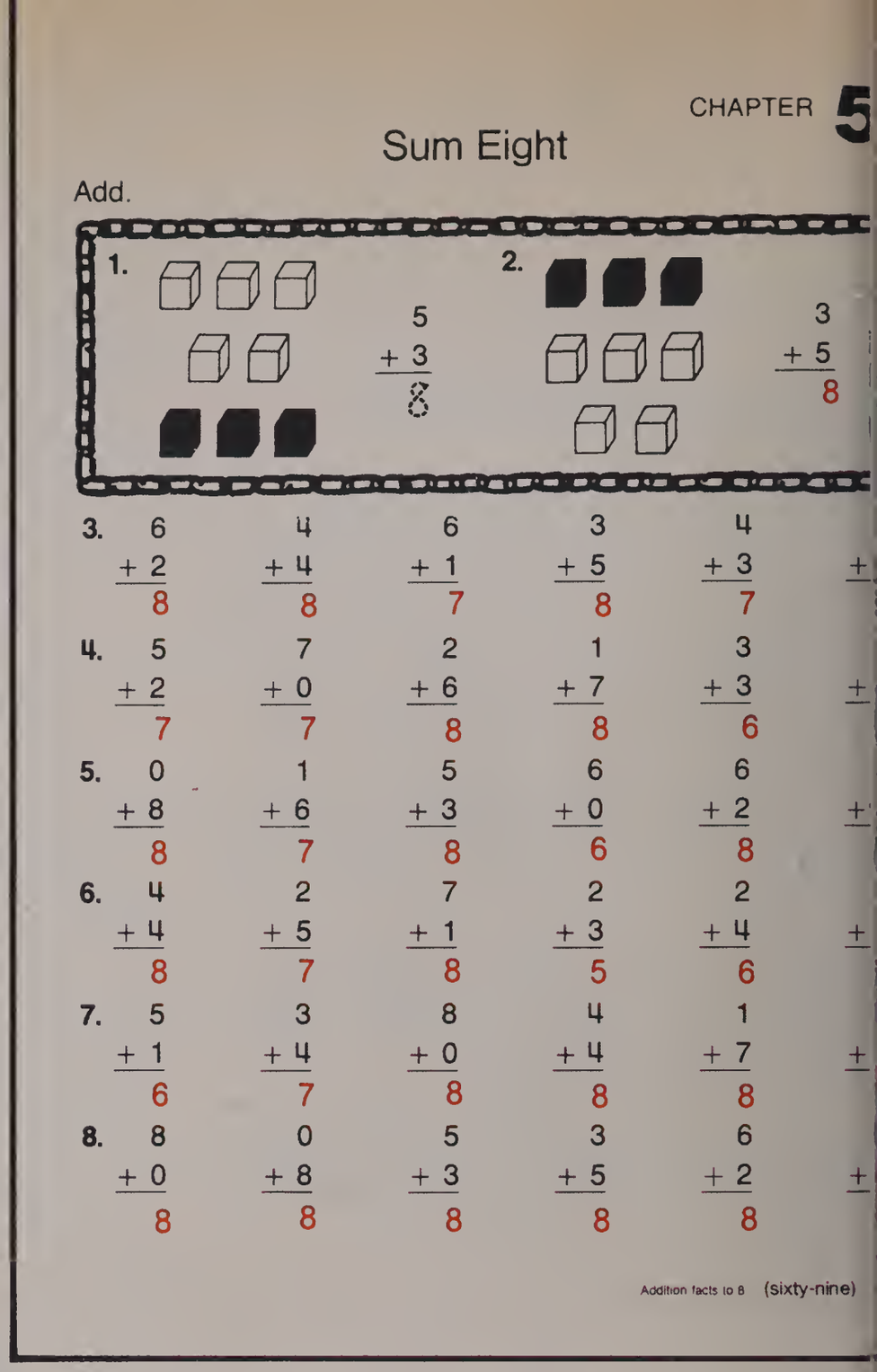
1 + 7 = ____

(Complete each blank as you develop each sum or difference.) Give the child 8 blocks. Develop 7 + 1 = 8 by having the child show a set of 7 blocks and a set with 1 block. For 1 + 7 = 8, have the child show a set with 1 block and a set with 7 blocks.

2. Develop other facts for sum 8 by adapting the procedures above.

RELATED AIDS

ACT. MASTERS—18.
—Seasonal 1, 2.
—Gen. Use 7-9, 13.
BFA COMP LAB I—8, 9.



Using the Book Panel 1: Ask, "How many yellow blocks? (5) How many red blocks? (3) How many blocks in all? (8) Five plus 3 is equal to what number? (8)" Have the child read the first sentence, 5 + 3 = 8, and trace the sum.

Panel 2: Adapt the procedures in panel 1.

Elicit that the two sentences show the addition with the same addends in different order.

Panels 3-8: Have the child add.

Add.

4 + 4 = 8	6 + 0 = 6	5 + 2 = 7	0 + 4 = 4	7 + 1 = 8	
3 + 3 = 6	5 + 3 = 8	3 + 2 = 5	8 + 0 = 8	5 + 1 = 6	4 + 3 = 7
2 + 2 = 4	7 + 0 = 7	1 + 2 = 3	2 + 4 = 6	5 + 0 = 5	6 + 2 = 8
1 + 7 = 8	4 + 1 = 5	2 + 5 = 7	0 + 6 = 6	4 + 4 = 8	3 + 1 = 4
4 + 2 = 6	0 + 8 = 8			6 + 1 = 7	3 + 5 = 8
2 + 6 = 8	4 + 0 = 4	2 + 2 = 4	3 + 4 = 7	2 + 3 = 5	7 + 1 = 8
1 + 6 = 7	0 + 5 = 5	4 + 4 = 8	1 + 4 = 5	3 + 3 = 6	8 + 0 = 8
1 + 3 = 4	6 + 2 = 8	2 + 1 = 3	0 + 7 = 7	1 + 5 = 6	5 + 3 = 8

Using the Book Panels 1–8: Tell the child to add.

RELATED AIDS

ACT. MASTERS—18.
—Seasonal 1, 2.
—Gen. Use 7-9, 13.
BFA COMP LAB I—8, 9.

OBJECTIVE

To add, sums 8 and less

PACING

Level A	All
Level B	All
Level C	All

ACTIVITIES

1. Four or five children may play a guessing game. The children take turns being the leader. The leader says, for example, "I am thinking of two numbers. Their sum is 4. What are the numbers?" Then each child with the correct guess gets one point. The first child who scores 5 points wins. Have the children play this game for sums 8 and less.

2. Write a numeral such as 8. Have the child write all the vertical addition problems for sum 8 that he or she can think of. You may make a contest of this game for two children or a group of children. For a group of children, each team works together to write problems for that number. The team with more correct problems is the winner.

EXTRA PRACTICE

Tell the child to add.

1.	4 + 3 = 7	6 + 2 = 8	0 + 8 = 8	1 + 7 = 8	2 + 5 = 7
2.	3 + 1 = 4	1 + 4 = 5	5 + 0 = 5	2 + 6 = 8	4 + 4 = 8
3.	2 + 4 = 6	5 + 3 = 8	6 + 0 = 6	1 + 2 = 3	2 + 2 = 4
4.	8 + 0 = 8	5 + 1 = 6	1 + 1 = 2	7 + 1 = 8	3 + 4 = 7
5.	4 + 1 = 5	3 + 3 = 6	1 + 6 = 7	7 + 0 = 7	3 + 2 = 5
6.	5 + 2 = 7	2 + 1 = 3	6 + 1 = 7	4 + 0 = 4	3 + 5 = 8

OBJECTIVE

To add, sums 9 and less

PACING

Level A	71 All (1-3 guided) 72 All
Level B	71 All (1 guided) 72 All
Level C	71 All (1 guided) 72 All

MATERIALS

9 blocks

SUGGESTIONS

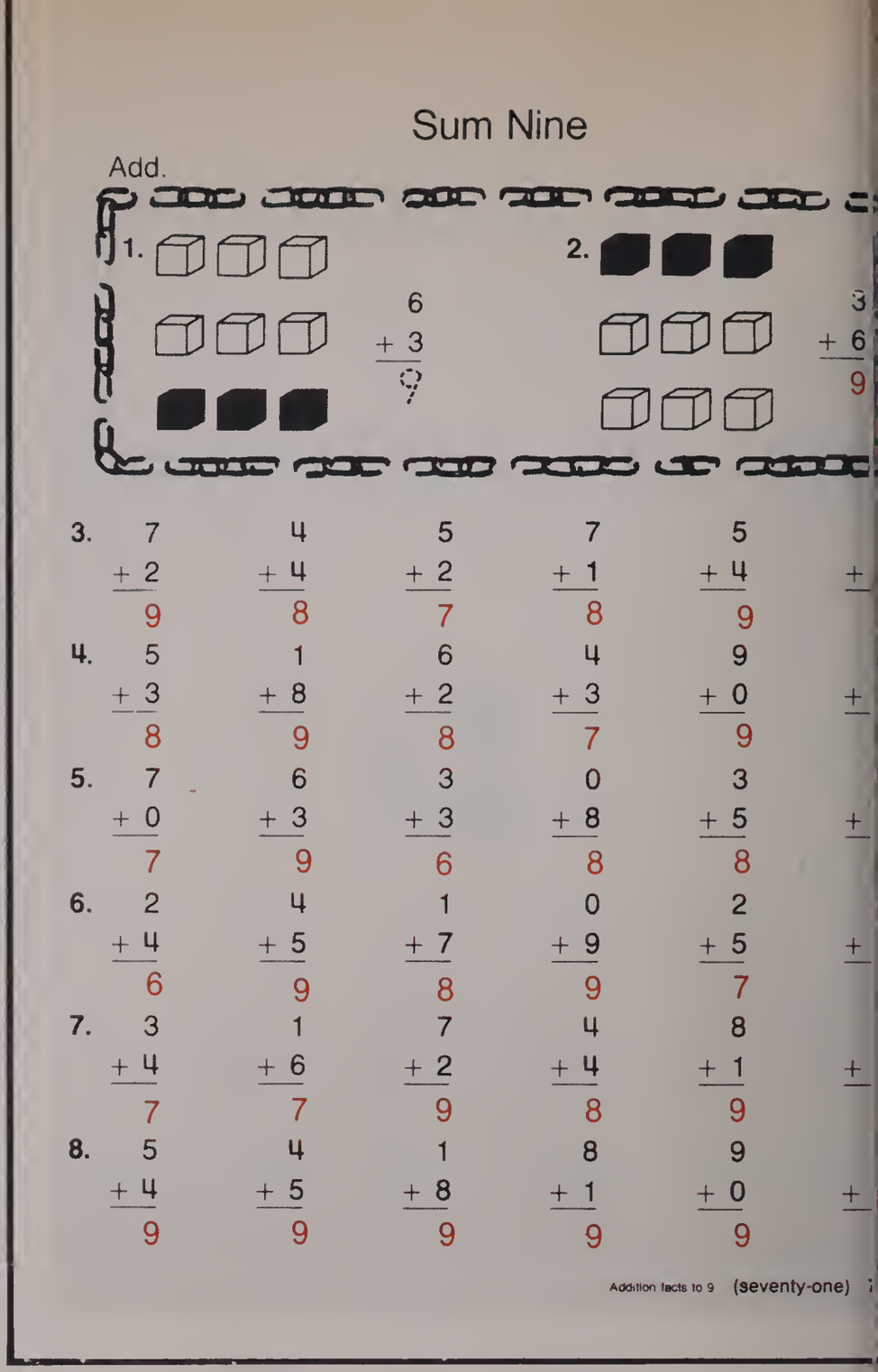
Initial Activity On the chalkboard write $\begin{array}{r} 7 \\ +2 \end{array}$. Give the child 9 blocks. Have the child show a set of 7 blocks and a set of 2 blocks. Say, "7 plus 2 equals 9." Have the child write the sum on the board.

Develop other facts for sum 9 by adapting the procedure above. To develop $\begin{array}{r} 9 \\ +0 \end{array}$, show 9 blocks. Ask, "If we don't add any more blocks, how many blocks are there in all? (9)"

ACTIVITIES

1. Prepare a Basic Fact Wheel as described in the Activity Reservoir for sums 9 and less. The child may use the wheel to practice sums through 9.

2. Give the child an oral drill on addition through sum 9. Have the child try to find the sums without writing the problems.



Using the Book Panel 1: Ask, "How many yellow blocks? (6) How many blue blocks? (3) How many blocks in all? (9)" Have the child read the first problem and trace the sum 9.

Panel 2: Adapt the procedure in panel 1. Then ask, "Are the addends the same? (yes) Is the sum the same? (yes) Does changing the order of the addends change the sum? (no)" Have the child write the sum (9).

Panels 3-8: Have the child add.

Add.

5 + 4 = 9	1 + 6 = 7	4 + 4 = 8	6 + 0 = 6	8 + 1 = 9	6 + 2 = 8
8 + 0 = 8	4 + 3 = 7	5 + 1 = 6	6 + 3 = 9	3 + 3 = 6	7 + 2 = 9
4 + 2 = 6	9 + 0 = 9	3 + 2 = 5	5 + 3 = 8	2 + 2 = 4	7 + 1 = 8
7 + 0 = 7	1 + 8 = 9	2 + 5 = 7	1 + 4 = 5	4 + 5 = 9	6 + 1 = 7
2 + 3 = 5	3 + 6 = 9	0 + 6 = 6	6 + 2 = 8	1 + 5 = 6	2 + 7 = 9
2 + 4 = 6	4 + 4 = 8	5 + 2 = 7	0 + 9 = 9	3 + 4 = 7	8 + 1 = 9
3 + 3 = 6	4 + 5 = 9			0 + 7 = 7	3 + 5 = 8
1 + 7 = 8	0 + 8 = 8			6 + 3 = 9	7 + 2 = 9

Using the Book Panels 1-8: Tell the child to add.

RELATED AIDS

ACT. MASTERS—18.
—Seasonal 1, 2.
—Gen. Use 7-9, 13.
BFA COMP LAB I—8, 9.

ACTIVITIES

1. Group several children for a game in which the children give different addition problems for the same sum. Write a numeral and the names of the children. For example:

6

Amy Lee Greg

As each child states a problem, such as:

3 + 3, 2 + 4, 6 + 0,

write that problem below the child's name. The child with the most correct responses wins.

2. The child should enjoy working with Bulletin Board suggestion 1 as given in the Chapter Overview. Adapt for addition through sum 9.

3. Have the children challenge each other with vertical addition problems through sum 9. Have one child write the problem on the chalkboard, a second child answer the problem, and a third child check over the work.

EXTRA PRACTICE

Practice Exercises p. 251 (top)

Tell the child to add.

1.	2 + 7 = 9	6 + 1 = 7	8 + 0 = 8	3 + 6 = 9	4 + 4 = 8
2.	1 + 2 = 3	0 + 5 = 5	4 + 2 = 6	9 + 0 = 9	7 + 1 = 8
3.	2 + 2 = 4	5 + 3 = 8	4 + 5 = 9	2 + 6 = 8	1 + 4 = 5
4.	0 + 7 = 7	3 + 2 = 5	1 + 8 = 9	7 + 2 = 9	4 + 3 = 7
5.	2 + 5 = 7	6 + 0 = 6	3 + 3 = 6	5 + 4 = 9	0 + 8 = 8
6.	1 + 7 = 8	2 + 0 = 2	6 + 2 = 8	0 + 9 = 9	4 + 2 = 6

OBJECTIVES

To make a calendar for the current month
To know the days of a week and the number of days in a week
To know the number of months in a year

PACING

Level A All (guided)
Level B All (guided)
Level C All (1-4 guided)

VOCABULARY

days of the week, months of the year, calendar

MATERIALS

calendar for current year

SUGGESTIONS

Initial Activities 1. Study the calendar for the year. Assist the child in reading the months. Have the child count the months in the year and tell the number of days in each month.

2. Turn the calendar to the current month. Ask, "How many days in this month?" Assist the child in reading the days of the week. Ask, "How many days in a week? (7) What day of the week is the first day of this month? The last day? The third day? The eighth day?" Then ask, "How many days in this month?"

ACTIVITIES

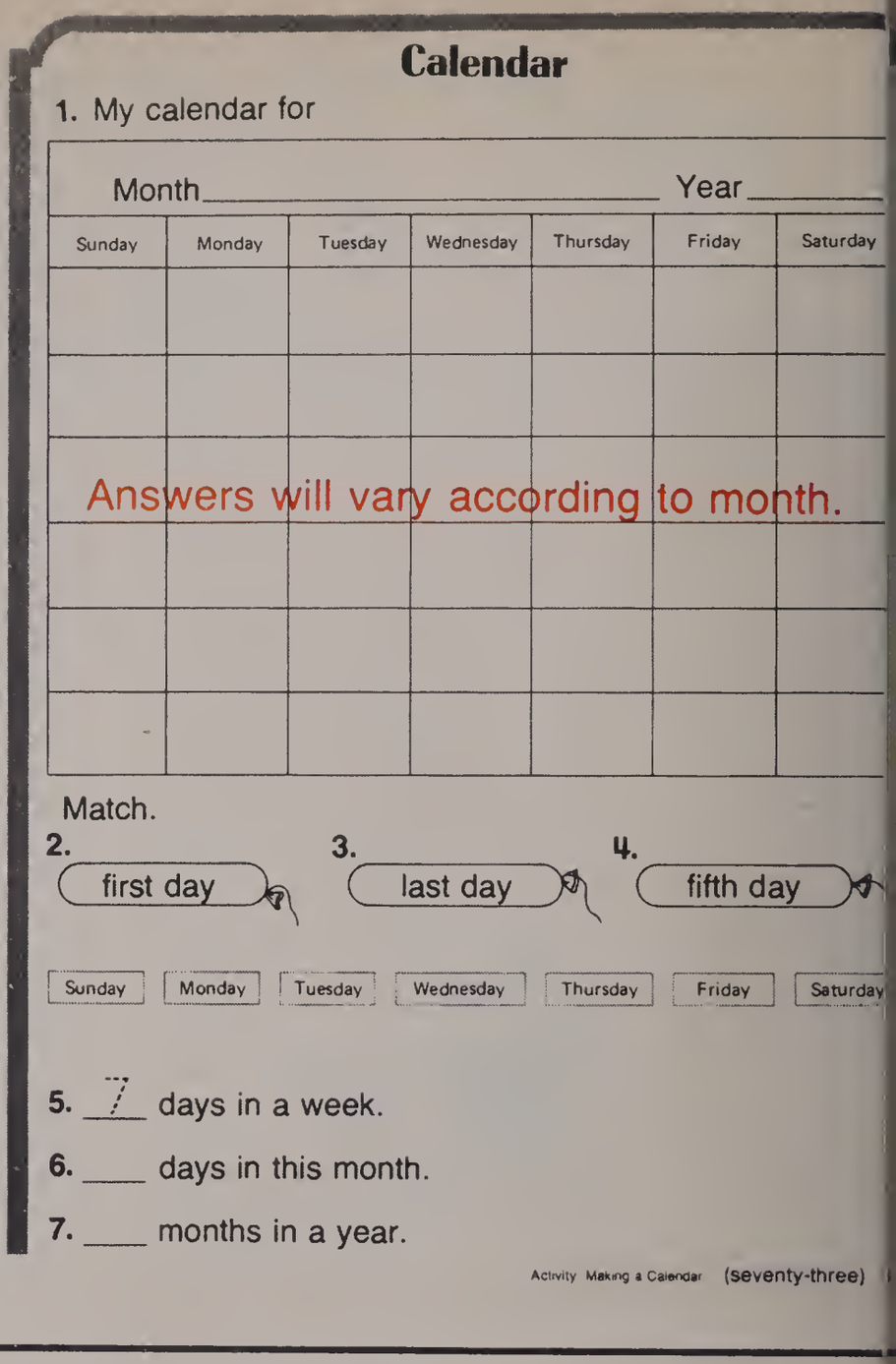
1. Use Bulletin Board suggestion 3 in the Chapter Overview.

2. Construct a large blank calendar. Use small nails in each frame to hold numeral tags. Use card strips for the month and the year. Then, for each month hereafter, have the child place the correct numeral tag to keep up with the date of each day.

3. Construct a two-column poster with headings: "Month, Number of Days." Have the child find and write the number of days in each month.

RELATED AIDS

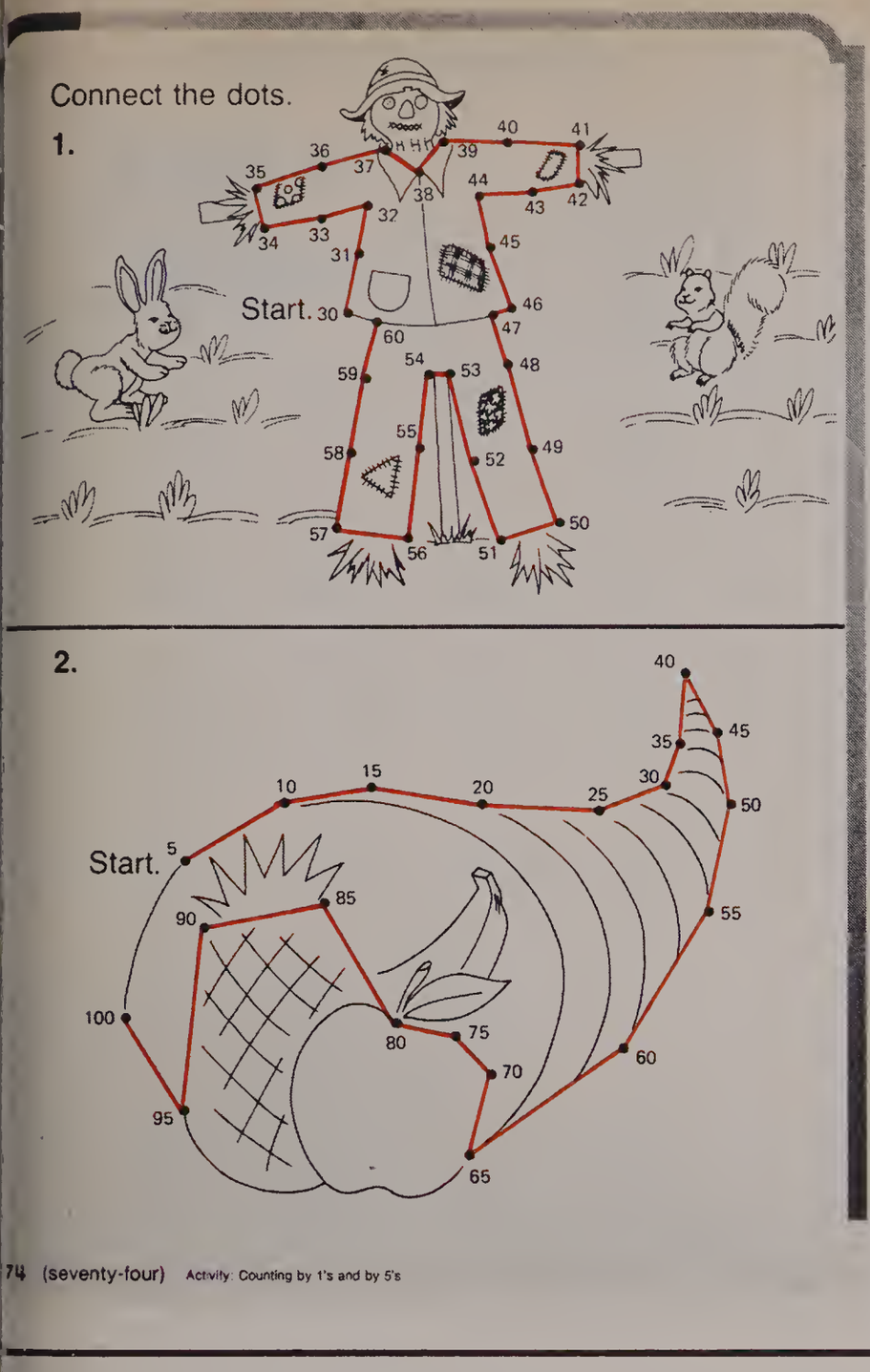
ACT. MASTERS—15, 16.



Using the Book Panel 1: The child may use the current calendar to assist in completing the calendar in panel 1. Assist the child in reading the days of the week at the top. You may need to assist the child in writing the month and the year. Ask, "How many days in this month? What day of the week is the first day of this month on?" Be sure the child places the numeral 1 in the proper frame. Then guide the child in completing the calendar for the current month. When the calendar is completed, you may ask questions such as, "How many Sundays in this month? What is the date of the first Sunday of this month?"

Panels 2-4: After the calendar is completed, have the child draw a mark from the phrase on the balloon to the day of the week it describes.

Panels 5-7: Have the child write the numerals to answer the questions.



Using the Book For this activity page, have the child connect the dots in each panel to make a picture.

Panel 1: Tell the child to start at 30 and count by 1's through 60 in order to connect the dots. The picture is a scarecrow.

Panel 2: Tell the child to start at 5 and count by 5's through 100 in order to connect the dots. The picture is a cornucopia (horn of plenty).

When each panel is completed, you might want to have the child color each picture.

OBJECTIVE

To count by 1's and 5's through 100

PACING

Level A	All
Level B	All
Level C	All

MATERIALS

numeral cards for counting by 5's

SUGGESTIONS

Initial Activity Review counting by 5's through 100. Shuffle numeral cards. Have the child arrange them in order to show counting by fives. Have another child read the numeral on each card.

ACTIVITIES

1. Duplicate dot pictures for practice on counting by 1's and 5's.

2. Adapt the game Pop Up described in the Activity Reservoir for counting by 5's through 100.

3. Adapt the game Zip Up described in the Activity Reservoir for counting by 5's.

OBJECTIVE

To subtract from 8 and less

PACING

Level A	All (1-3 guided)
Level B	All (1-2 guided)
Level C	All (1-2 guided)

MATERIALS

8 blocks

SUGGESTIONS

Initial Activity On the chalkboard write $\begin{array}{r} 8 \\ -1 \\ \hline \end{array}$ Give the child 8 blocks. Develop the subtraction by having the child show a set of 8 blocks. Then take away 1 block. Say, "8 minus 1 equals 7." Have the child write the difference on the board.

Develop other subtraction facts for 8 by adapting the procedure above. Develop $\begin{array}{r} 8 \\ -0 \\ \hline \end{array}$. Show 8 blocks. Ask, "If we do not take away any blocks, how many blocks are left?" (8)

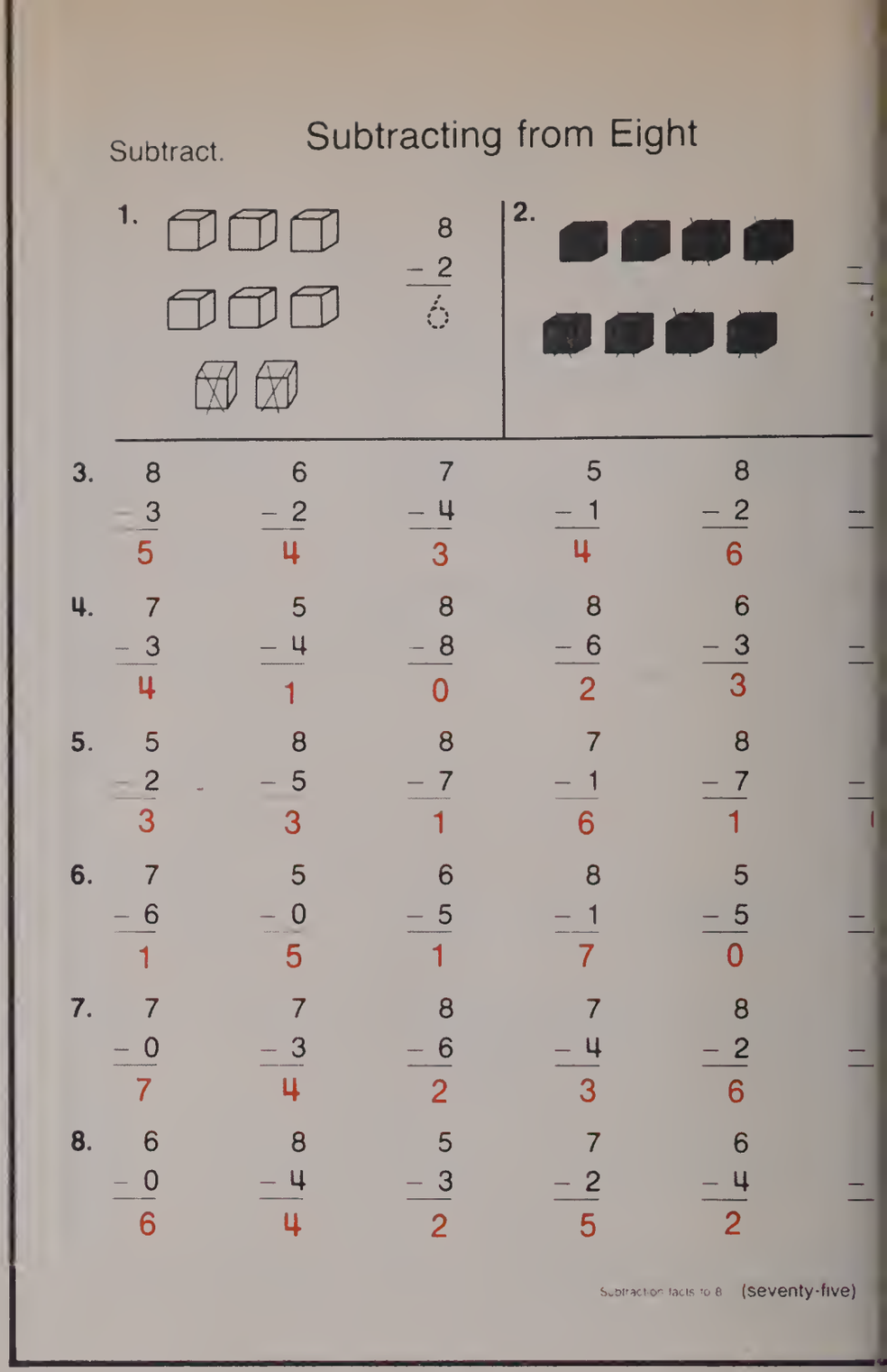
ACTIVITIES

1. Have the child work with subtraction practice cards (vertical form) for sum 8. Also give the child 8 blocks. For each practice card, the child demonstrates the subtraction with the blocks. Then the child writes the difference.

2. The child may wish to verify the answers in the activity above using a mini-calculator.

RELATED AIDS

ACT. MASTERS—18.
—Seasonal 3, 4.
—Gen. Use 10, 11,13.
BFA COMP LAB 1—46, 47.



Subtract. Subtracting from Eight

1.

$\begin{array}{r} 8 \\ -2 \\ \hline 6 \end{array}$

2.

3.	$\begin{array}{r} 8 \\ -3 \\ \hline 5 \end{array}$	$\begin{array}{r} 6 \\ -2 \\ \hline 4 \end{array}$	$\begin{array}{r} 7 \\ -4 \\ \hline 3 \end{array}$	$\begin{array}{r} 5 \\ -1 \\ \hline 4 \end{array}$	$\begin{array}{r} 8 \\ -2 \\ \hline 6 \end{array}$
4.	$\begin{array}{r} 7 \\ -3 \\ \hline 4 \end{array}$	$\begin{array}{r} 5 \\ -4 \\ \hline 1 \end{array}$	$\begin{array}{r} 8 \\ -8 \\ \hline 0 \end{array}$	$\begin{array}{r} 8 \\ -6 \\ \hline 2 \end{array}$	$\begin{array}{r} 6 \\ -3 \\ \hline 3 \end{array}$
5.	$\begin{array}{r} 5 \\ -2 \\ \hline 3 \end{array}$	$\begin{array}{r} 8 \\ -5 \\ \hline 3 \end{array}$	$\begin{array}{r} 8 \\ -7 \\ \hline 1 \end{array}$	$\begin{array}{r} 7 \\ -1 \\ \hline 6 \end{array}$	$\begin{array}{r} 8 \\ -7 \\ \hline 1 \end{array}$
6.	$\begin{array}{r} 7 \\ -6 \\ \hline 1 \end{array}$	$\begin{array}{r} 5 \\ -0 \\ \hline 5 \end{array}$	$\begin{array}{r} 6 \\ -5 \\ \hline 1 \end{array}$	$\begin{array}{r} 8 \\ -1 \\ \hline 7 \end{array}$	$\begin{array}{r} 5 \\ -5 \\ \hline 0 \end{array}$
7.	$\begin{array}{r} 7 \\ -0 \\ \hline 7 \end{array}$	$\begin{array}{r} 7 \\ -3 \\ \hline 4 \end{array}$	$\begin{array}{r} 8 \\ -6 \\ \hline 2 \end{array}$	$\begin{array}{r} 7 \\ -4 \\ \hline 3 \end{array}$	$\begin{array}{r} 8 \\ -2 \\ \hline 6 \end{array}$
8.	$\begin{array}{r} 6 \\ -0 \\ \hline 6 \end{array}$	$\begin{array}{r} 8 \\ -4 \\ \hline 4 \end{array}$	$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array}$	$\begin{array}{r} 7 \\ -2 \\ \hline 5 \end{array}$	$\begin{array}{r} 6 \\ -4 \\ \hline 2 \end{array}$

Subtraction facts to 8 (seventy-five)

Using the Book Panel 1: Ask, "How many blocks in all? (8) How many blocks have X's on them? (2) How many are left? (6)" Have the child read the subtraction and trace the difference.

Panel 2: Adapt the procedure in panel 1.

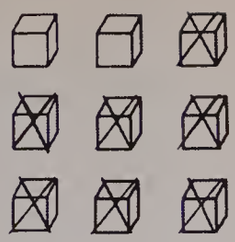
Panels 3-8: Tell the child to subtract.

Subtracting from Nine

Subtract.

$$\begin{array}{r} 9 \\ -\ 2 \\ \hline 7 \end{array}$$

2.



$$\begin{array}{r} 9 \\ -\ 7 \\ \hline 2 \end{array}$$

$\begin{array}{r} 8 \\ -\ 6 \\ \hline 2 \end{array}$	$\begin{array}{r} 9 \\ -\ 8 \\ \hline 1 \end{array}$	$\begin{array}{r} 7 \\ -\ 4 \\ \hline 3 \end{array}$	$\begin{array}{r} 9 \\ -\ 0 \\ \hline 9 \end{array}$	$\begin{array}{r} 9 \\ -\ 6 \\ \hline 3 \end{array}$	$\begin{array}{r} 8 \\ -\ 1 \\ \hline 7 \end{array}$
$\begin{array}{r} 9 \\ -\ 7 \\ \hline 2 \end{array}$	$\begin{array}{r} 7 \\ -\ 6 \\ \hline 1 \end{array}$	$\begin{array}{r} 8 \\ -\ 3 \\ \hline 5 \end{array}$	$\begin{array}{r} 9 \\ -\ 4 \\ \hline 5 \end{array}$	$\begin{array}{r} 7 \\ -\ 1 \\ \hline 6 \end{array}$	$\begin{array}{r} 9 \\ -\ 9 \\ \hline 0 \end{array}$
$\begin{array}{r} 8 \\ -\ 7 \\ \hline 1 \end{array}$	$\begin{array}{r} 6 \\ -\ 4 \\ \hline 2 \end{array}$	$\begin{array}{r} 9 \\ -\ 5 \\ \hline 4 \end{array}$	$\begin{array}{r} 7 \\ -\ 3 \\ \hline 4 \end{array}$	$\begin{array}{r} 7 \\ -\ 0 \\ \hline 7 \end{array}$	$\begin{array}{r} 9 \\ -\ 3 \\ \hline 6 \end{array}$
$\begin{array}{r} 9 \\ -\ 4 \\ \hline 5 \end{array}$	$\begin{array}{r} 7 \\ -\ 7 \\ \hline 0 \end{array}$	$\begin{array}{r} 6 \\ -\ 5 \\ \hline 1 \end{array}$	$\begin{array}{r} 9 \\ -\ 1 \\ \hline 8 \end{array}$	$\begin{array}{r} 8 \\ -\ 5 \\ \hline 3 \end{array}$	$\begin{array}{r} 9 \\ -\ 8 \\ \hline 1 \end{array}$
$\begin{array}{r} 6 \\ -\ 3 \\ \hline 3 \end{array}$	$\begin{array}{r} 8 \\ -\ 2 \\ \hline 6 \end{array}$	$\begin{array}{r} 9 \\ -\ 5 \\ \hline 4 \end{array}$	$\begin{array}{r} 8 \\ -\ 0 \\ \hline 8 \end{array}$	$\begin{array}{r} 9 \\ -\ 7 \\ \hline 2 \end{array}$	$\begin{array}{r} 7 \\ -\ 2 \\ \hline 5 \end{array}$
$\begin{array}{r} 8 \\ -\ 4 \\ \hline 4 \end{array}$	$\begin{array}{r} 9 \\ -\ 9 \\ \hline 0 \end{array}$	$\begin{array}{r} 7 \\ -\ 5 \\ \hline 2 \end{array}$	$\begin{array}{r} 9 \\ -\ 2 \\ \hline 7 \end{array}$	$\begin{array}{r} 8 \\ -\ 8 \\ \hline 0 \end{array}$	$\begin{array}{r} 9 \\ -\ 6 \\ \hline 3 \end{array}$

sing the Book Panel 1: Ask, "How many blocks in all? (9) How many have 's on them? (2) How many are left?" (7) Have the child read the subtraction nd trace the answer.

Panel 2: Adapt the procedure in panel 1.

Panels 3–8: Tell the child to subtract.

RELATED AIDS

ACT. MASTERS—18.
—Seasonal 3, 4.
—Gen. Use 10, 11,13.
BFA COMP LAB I—46, 47.

OBJECTIVE

To subtract from 9 and less

PACING

Level A	76 All (1-3 guided) 77 All
Level B	76 All (1-2 guided) 77 All
Level C	76 All (1-2 guided) 77 All

MATERIALS

9 blocks

SUGGESTIONS

Initial Activity On the chalkboard write $\begin{array}{r} 9 \\ -3 \\ \hline \end{array}$. Give the child 9 blocks. Develop the subtraction by having the child show a set of 9 blocks. Then take away 3 blocks. Say, "9 minus 3 equals 6." Then have the child write the difference on the chalkboard.

Develop other subtraction facts for 9 by adapting the procedure above. Develop $\begin{array}{r} 9 \\ -0 \\ \hline \end{array}$. Show 9 blocks. Ask, "If we do not take away any blocks, how many blocks are left?" (9)

ACTIVITIES

1. Prepare a Basic Fact Wheel as described in the Activity Reservoir for subtracting from 9 and less. The child may use the wheel to practice subtraction facts.

2. Give the child an oral drill on subtraction from 9 and less. Have the child try to find the differences without writing out the problems.

EXTRA PRACTICE

1.	$\begin{array}{r} 7 \\ -6 \\ \hline 1 \end{array}$	$\begin{array}{r} 2 \\ -0 \\ \hline 2 \end{array}$	$\begin{array}{r} 8 \\ -8 \\ \hline 0 \end{array}$	$\begin{array}{r} 9 \\ -4 \\ \hline 5 \end{array}$	$\begin{array}{r} 6 \\ -4 \\ \hline 2 \end{array}$
2.	$\begin{array}{r} 9 \\ -6 \\ \hline 3 \end{array}$	$\begin{array}{r} 4 \\ -3 \\ \hline 1 \end{array}$	$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array}$	$\begin{array}{r} 9 \\ -1 \\ \hline 8 \end{array}$	$\begin{array}{r} 7 \\ -2 \\ \hline 5 \end{array}$
3.	$\begin{array}{r} 6 \\ -2 \\ \hline 4 \end{array}$	$\begin{array}{r} 9 \\ -9 \\ \hline 0 \end{array}$	$\begin{array}{r} 8 \\ -5 \\ \hline 3 \end{array}$	$\begin{array}{r} 7 \\ -0 \\ \hline 7 \end{array}$	$\begin{array}{r} 8 \\ -4 \\ \hline 4 \end{array}$

OBJECTIVE

To practice subtraction from 9 and less

PACING

Level A All
Level B All
Level C All

SUGGESTIONS

If children have unusual difficulty with the exercises on this page, you could provide appropriate remedial work. Use blocks or objects to have the child show the subtraction. Then have the child record the answer.

ACTIVITIES

1. Group several children for a game in which the children give different subtraction problems for the same difference. Write a numeral and the names of the children. For example:

3

Jim Sue Maria

As each child states a problem, such as:

$\begin{array}{r} 8 \\ -5 \\ \hline \end{array}$, $\begin{array}{r} 6 \\ -3 \\ \hline \end{array}$, $\begin{array}{r} 9 \\ -6 \\ \hline \end{array}$,

write that problem below the child's name. The child with the most correct responses wins.

2. The child should enjoy working with Bulletin Board suggestion 1 as given in the Chapter Overview. Adapt for subtracting from 9 and less.

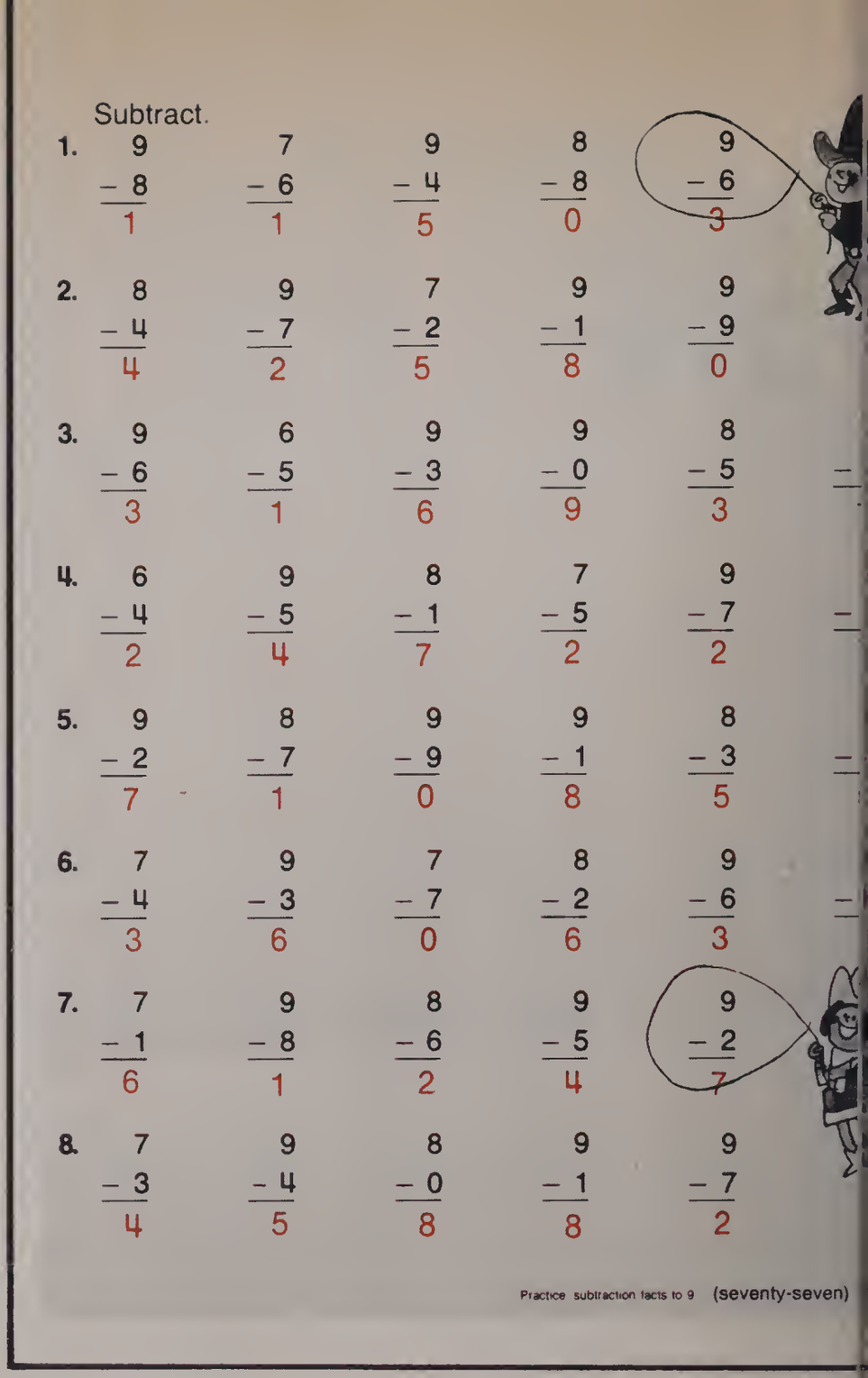
Have the children challenge each other with vertical subtraction problems from 9 and less. Have one child write the problem on the chalkboard, a second child answer the problem, and a third child check over the work.

EXTRA PRACTICE

Practice Exercises p. 251 (bottom)

Tell the child to subtract.

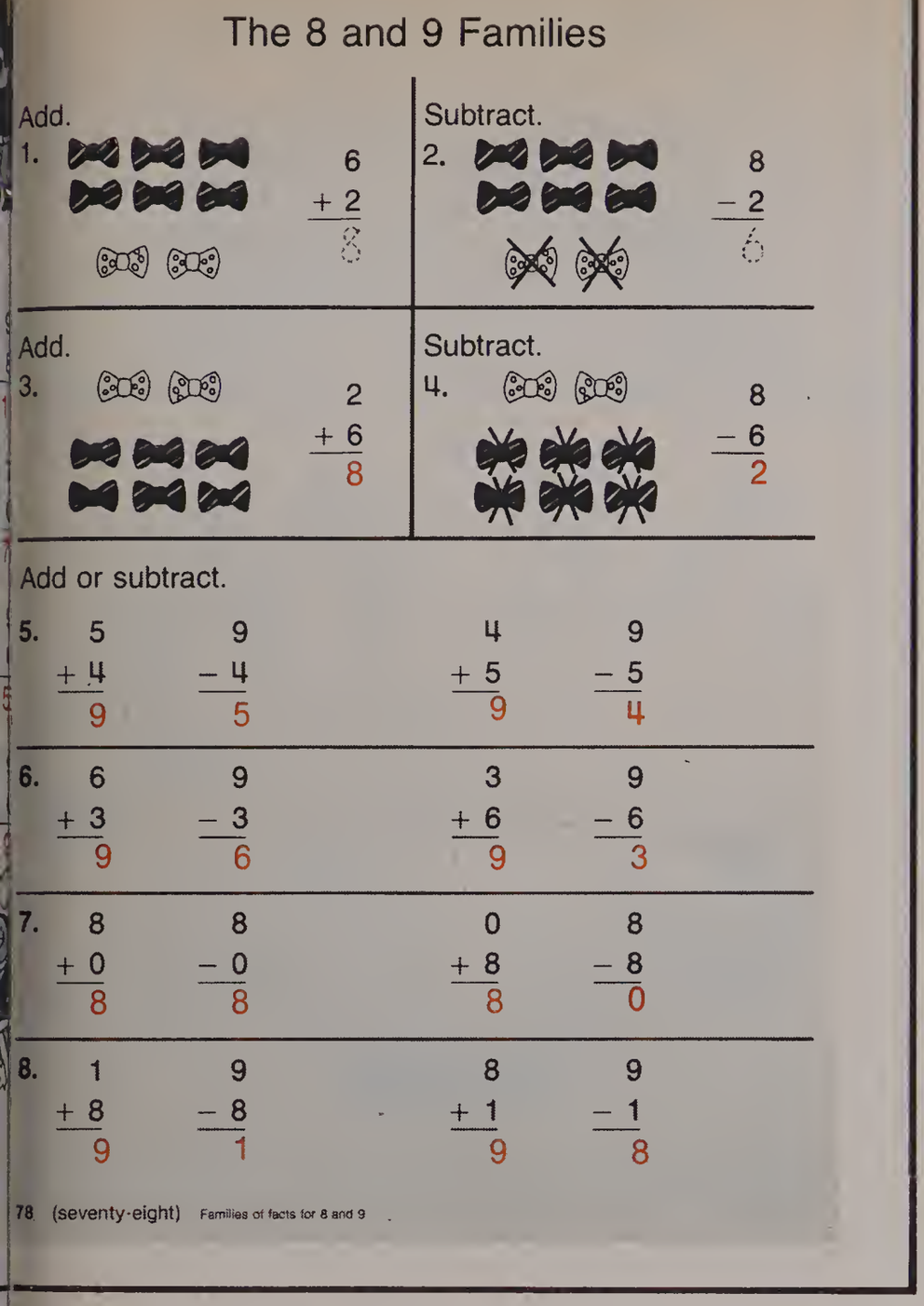
1.	8 − 2 = 6	7 − 4 = 3	6 − 1 = 5	9 − 8 = 1	4 − 4 = 0
2.	9 − 2 = 7	5 − 0 = 5	7 − 3 = 4	8 − 1 = 7	3 − 2 = 1
3.	6 − 3 = 3	2 − 2 = 0	9 − 0 = 9	5 − 2 = 3	4 − 1 = 3



Using the Book Panels 1-8: Tell the child to subtract.

RELATED AIDS

ACT. MASTERS—18.
—Seasona
—Gen. Us
13.
BFA COMP LAB I—46, 47



Using the Book Panels 1–2: Relate the addition to the picture by telling a story. For example, "There are 6 red bow ties and 2 yellow bow ties. How many bow ties are there in all? (8) Six plus 2 is what number?" Have the child trace the 8. For the subtraction, say "There were 8 bow ties. 2 bow ties were taken away. How many bow ties are left? (6) Eight minus 2 is what number?" Have the child trace the 6. Explain that panel 1 shows adding 2 to 6 to get the sum 8. And panel 2 shows subtracting 2 from the sum 8 to get 6. Tell the child that these are related addition and subtraction exercises.

Panels 3–4: Notice that the order of the addends is changed to show adding 6 and subtracting 6. Relate a similar story and have the child complete each panel.

Panels 5–8: Tell the child to add or subtract.

OBJECTIVE

To add and subtract using related addition and subtraction sentences, sums 8 and 9

PACING

Level A	78 All (1-4 guided)
	79 All (1 guided)
Level B	78 All (1-4 guided)
	79 All (1 guided)
Level C	78 All (1 guided)
	79 All

BACKGROUND

See item 2 of the Chapter Overview Background.

SUGGESTIONS

Initial Activity Write on the chalkboard: 5 + 4 = ___. Assist the child in dramatizing the sentence. For example, have 5 girls stand by the door. Then have 4 boys join them. Ask, "How many children in all are by the door? (9)" Write 9 in the blank. Ask, "Now what must we do to undo the action shown by the sentence 5 + 4 = 9? (Have the 4 boys return to their seats.)" Write 9 - 4 = ___. Ask, "How many children are left by the door? (5)" Write 5 in the blank. Explain that the two sentences are related addition and subtraction sentences. Have the child show the vertical forms for these two sentences:

$$\begin{array}{r} 5 \\ +4 \\ \hline 9 \end{array} \qquad \begin{array}{r} 9 \\ -4 \\ \hline 5 \end{array}$$

ACTIVITIES

Use Bulletin Board suggestion 2, found in the Chapter Overview. Adapt for sums to 9 and subtracting from 9 and less.

RELATED AIDS

ACT. MASTERS—Gen. Use 2.

OBJECTIVE

To add and subtract using related addition and subtraction sentences, sums 8 and 9

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

Initial Activity Give the child blocks and have the child find out how many there are. Ask the child to take away 4 blocks and find out how many remain. Write the describing sentence on the blackboard. Then ask the child to put together the groups of 5 blocks and 4 blocks and find out how many there are. Write the describing sentence on the board. Point out the family of facts discovered. Repeat the activity for other 8 and 9 families.

ACTIVITIES

The child may play a fishing game for more practice on adding and subtracting, sums 7, 8, and 9. Place the vertical addition and subtraction practice cards, sums 7, 8, and 9, in a container. The children take turns if more than one child is involved.

First: Draw a card, read the exercise, and then give the answer.

Second: Write a related addition or subtraction.

Write these vertical problems:

$$\begin{array}{rrr} 2 & 1 & 4 \\ +5 & +8 & +4 \\ \hline 7 & 9 & 8 \end{array} \qquad \begin{array}{rrr} 3 & 5 & 7 \\ +6 & +3 & +0 \\ \hline 9 & 8 & 7 \end{array}$$

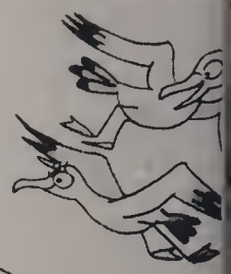
Have the child copy each problem, and then give a related subtraction.

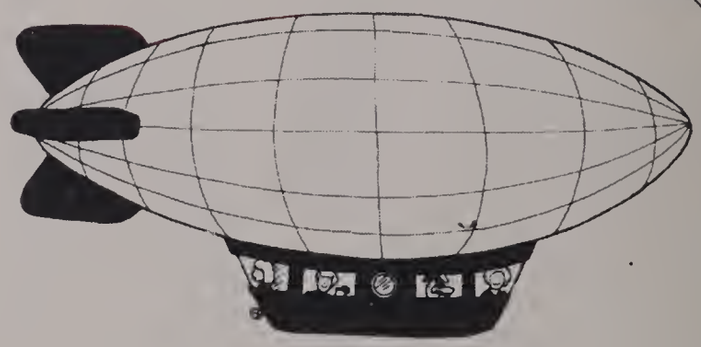
RELATED AIDS

ACT. MASTERS—Gen. Use 2.

Add or subtract.

1.	$\begin{array}{r} 7 \\ +1 \\ \hline 8 \end{array}$	$\begin{array}{r} 8 \\ -1 \\ \hline 7 \end{array}$	$\begin{array}{r} 1 \\ +7 \\ \hline 8 \end{array}$	$\begin{array}{r} 8 \\ -7 \\ \hline 1 \end{array}$
2.	$\begin{array}{r} 9 \\ +0 \\ \hline 9 \end{array}$	$\begin{array}{r} 9 \\ -0 \\ \hline 9 \end{array}$	$\begin{array}{r} 0 \\ +9 \\ \hline 9 \end{array}$	$\begin{array}{r} 9 \\ -9 \\ \hline 0 \end{array}$
3.	$\begin{array}{r} 2 \\ +7 \\ \hline 9 \end{array}$	$\begin{array}{r} 9 \\ -7 \\ \hline 2 \end{array}$	$\begin{array}{r} 7 \\ +2 \\ \hline 9 \end{array}$	$\begin{array}{r} 9 \\ -2 \\ \hline 7 \end{array}$
4.	$\begin{array}{r} 5 \\ +3 \\ \hline 8 \end{array}$	$\begin{array}{r} 8 \\ -3 \\ \hline 5 \end{array}$	$\begin{array}{r} 3 \\ +5 \\ \hline 8 \end{array}$	$\begin{array}{r} 8 \\ -5 \\ \hline 3 \end{array}$
5.	$\begin{array}{r} 4 \\ +4 \\ \hline 8 \end{array}$	$\begin{array}{r} 8 \\ -4 \\ \hline 4 \end{array}$		





Using the Book Panels 1–5: Have the child add or subtract.

Using the Book Describe or have the child describe the picture at the top of the page. See Career Awareness in the Chapter Overview.

Panel 1: Ask, "How many children are there in all? (7) How many are going away? (3) How many are left at the table? (4) Seven children, 3 are going away, how many are left? When we want to know how many are left, do we add or subtract? (subtract)" Relate 7 minus 3 to the picture and have the child trace the minus sign. Relate 4 to how many children are left. Have the child trace the and say "7 minus 3 equals 4."

Panels 2-4: If the child can proceed without assistance, tell the child to think of a story that goes with the picture. The question below each picture should be the last sentence in the story. The child should decide whether to add or subtract and then complete the number sentence. If the child cannot proceed without assistance, guide the child with questions similar to those for panel 1.

OBJECTIVE

To solve problems

PACING

Level A	All (guided)
Level B	All (1-2 guided)
Level C	All (1 guided)

SUGGESTIONS

Initial Activity The career for this page is Day Care Center Workers. Mention some of the reasons for day care centers, the ages of children attending them, and some of the activities that go on at the centers. Perhaps the child has attended a day care center. If so, encourage the child to tell about the activities at the center. Then use the activities as a basis for making up problems with questions like those on page 80.

Discuss the consumer aspect of this page. Most day care centers are supported by the tax dollar. It frees parents to work and/or help support the family and gives children a place to play with other children.

ACTIVITIES

1. Have children find and cut out pictures of children at play. Tell a story about each picture and match the questions, "How many in all?" or "How many are left?"

2. Give the child an opportunity to be creative by using tempera paint, or crayons. Assign a question, "How many in all?" or "How many are left?" The child is to use the question to create a picture problem about a day care center. Then answer the question.

3. Allow two children to take turns and challenge each other in a problem-solving game. The first child writes an incomplete sentence such as 7 ○ 2 = ___. The other child makes up a word problem to go with the incomplete sentence, and the first child completes the sentence and answers the question.

RELATED AIDS

ACT. MASTERS—Seasonal 5.

OBJECTIVES

To interpret mini-problems
To write a vertical addition for a mini-problem

PACING

Level A	All (guided)
Level B	All (1-3 guided)
Level C	All (1-2 guided)

MATERIALS

9 blocks

SUGGESTIONS

Mini-problems are presented for easy comprehension.

Initial Activities 1. Present the child with an addition problem similar to that in Panel 2. Illustrate using blocks. Have the child examine the problem, decide whether to add or subtract, and write the problem.

2. Develop problems with "take away" and "how many more" situations.

Discuss the consumer aspect of this page—losses, profits, and ecology concerns of community affairs (who cleans up afterwards).

ACTIVITIES

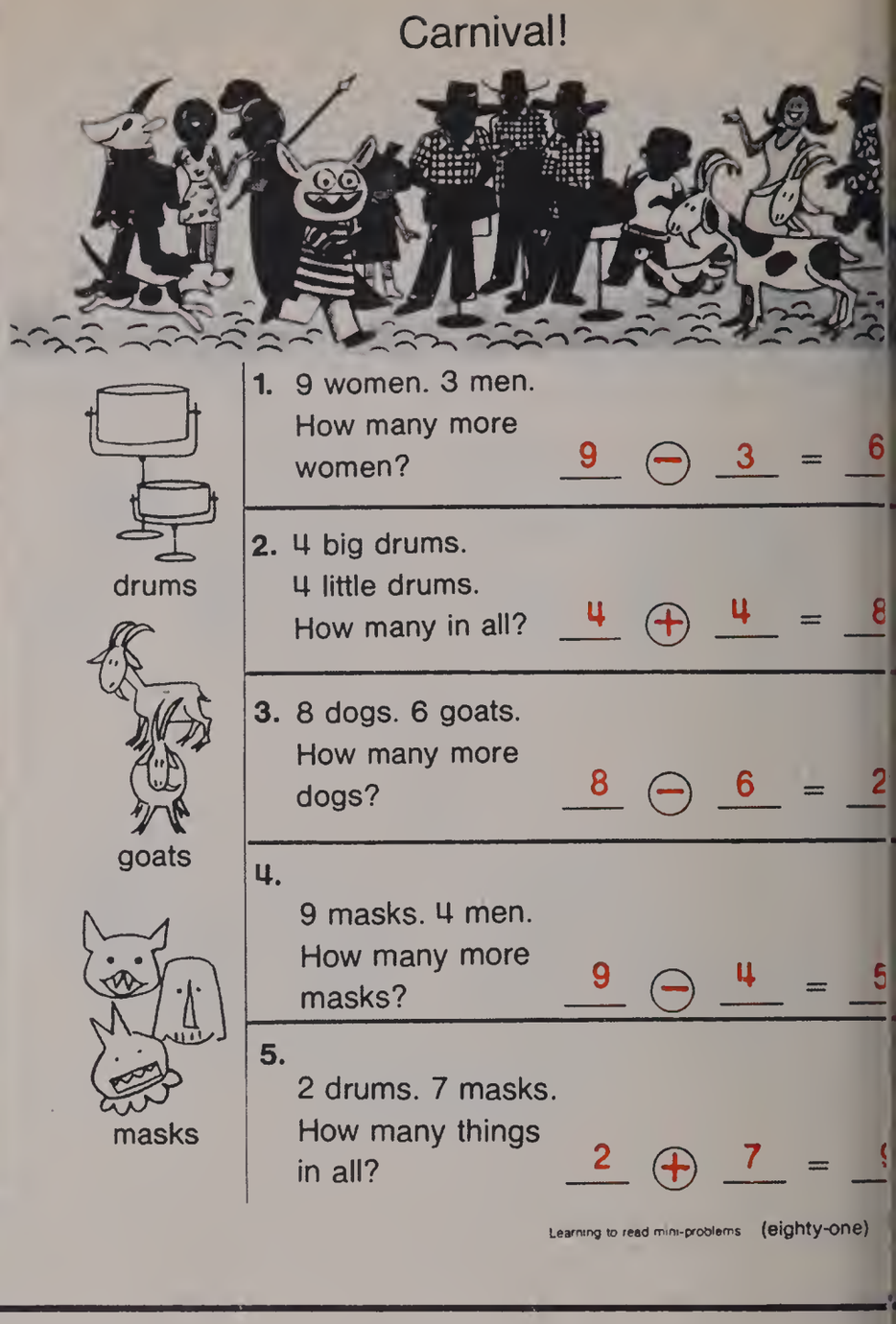
1. Use the basic fact practice cards for sums 9 and less.

2. Use a Basic Fact Wheel for subtracting from numbers 9 and less.

3. Perhaps the child can relate experiences of a carnival and write mini-problems about them.

RELATED AIDS

ACT. MASTERS—Seasonal 5.



Using the Book Solving mini-problems (short word problems) is introduced o this page. This mini-problem solving page, and several others, includes a picture dictionary. The dictionary is provided to help the child read the key words necessary to solve the problems. Ask the child to describe the picture. Then tell the child that it shows a carnival in faraway Trinidad, an island in the West Indi

Panel 1: Have the child read the mini-problem and then decide whether t add or subtract. Ask, "What do we subtract in this problem? (3)" Have the chil trace the numerals in the blanks and the correct sign in the ring. Then have the child complete the sentence. Ask, "How many more women? (6)"

Panels 2-5: Have the child read the problem, and write the numerals and the sign needed to make a sentence. Then have the child complete the sentence

Extra Practice

Add.

4	8	2	9		
+ 4	+ 1	+ 6	+ 0		
8	9	8	9		
2	1	6	0		
+ 5	+ 4	+ 3	+ 7		
7	5	9	7		
5	0	7	3	5	4
+ 3	+ 6	+ 1	+ 3	+ 4	+ 2
8	6	8	6	9	6
2	7	6	4	8	3
+ 3	+ 2	+ 1	+ 3	+ 0	+ 1
5	9	7	7	8	4
4	9	8	7	7	8
− 2	− 6	− 0	− 5	− 1	− 2
2	3	8	2	6	6
2	8	3	7	9	6
− 1	− 3	− 1	− 7	− 0	− 1
1	5	2	0	9	5
9	7	8	5	9	7
− 3	− 0	− 7	− 3	− 8	− 3
6	7	1	2	1	4
6	5	9	7	6	8
− 6	− 1	− 5	− 6	− 3	− 4
0	4	4	1	3	4

AT HOME: Read some of these exercises and have the child tell you the answers. Say, "What is 4 plus 4? and so on.

sing the Book Panels 1-4: Tell the child to add.
Panels 5-8: Tell the child to subtract.

t Home Upon completion of the pupil page, the child may take the page ome and do the At Home activity suggested at the bottom of the page.

OBJECTIVE

To add and subtract sums 9 or less

PACING

Level A	All
Level B	All
Level C	All

MATERIALS

Addition practice cards, sum cards for each child

SUGGESTIONS

Divide the children into two teams. Have each team stand on one side of a table. Each child gets a set of sum cards. Designate one child on each team to go first. Hold up an addition example (practice card). The two children compete to find the correct sum card first. The first to find the correct card gets one point. All children get a turn. The team with the most points wins.

ACTIVITIES

1. Adapt the Bingo game described in the Activity Reservoir. Use the vertical form for sums to 9 in the cells.

2. Adapt the game Stop the Magician described in the Activity Reservoir. Use sums to 9.

3. Adapt the game Concentration described in the Activity Reservoir for sums to 9. Use only 6 cards at a time.

EXTRA PRACTICE

Tell the child to add.

4	7	3	5	0
+4	+2	+0	+1	+8
8	9	3	6	8

Tell the child to subtract

6	4	7	6	8
-3	-1	-1	-0	-3
3	3	6	6	5

RELATED AIDS

ACT. MASTERS—18.
—Seasonal 1-4.
—Gen. Use 7-11, 13.
BFA COMP LAB I—8, 9, 46, 47.

OBJECTIVE

To identify pictures that show halves

PACING

Level A	All (1 guided)
Level B	All (1 guided)
Level C	All (1 guided)

VOCABULARY

halves

MATERIALS

red crayon, paper

SUGGESTIONS

Initial Activity Fold a sheet of paper so that the crease separates the sheet into halves. Color the crease red. Develop the idea that the crease separates the sheet into two parts and that the parts are the same size. Tell the child the sheet is separated into halves by the red mark.

ACTIVITIES

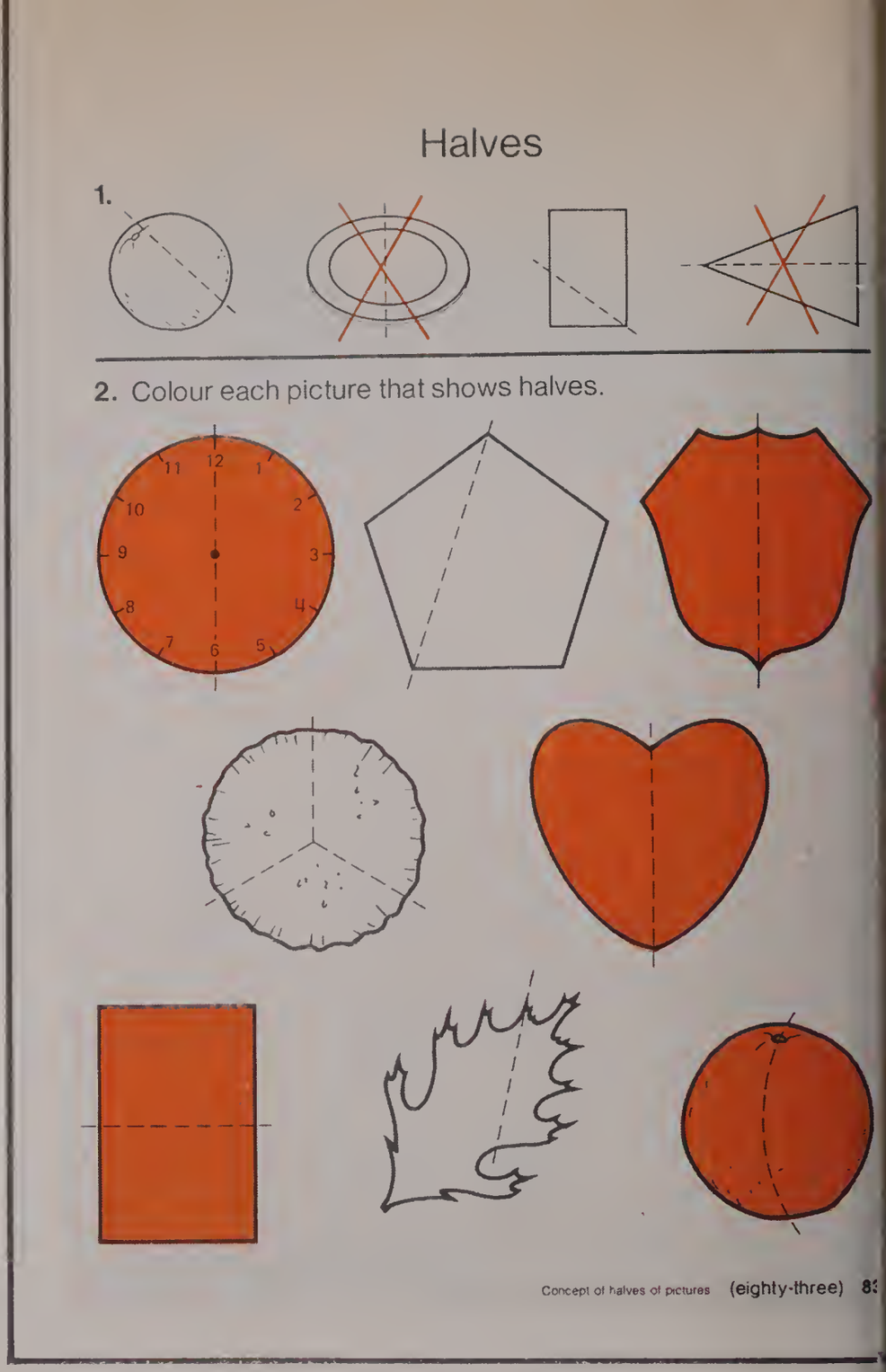
1. It might be fun to show the child 2 chocolate bars, one that is cut in half and another that is split into two unequal parts. If the one that is in halves can be identified, the child may eat it.

2. If possible, allow an opportunity for children to "share" paper, fruit, cookies, lemons, etc. Cut halves. The child should give another child half.

3. Give the child some rectangular and circular pieces of paper. For each piece, have the child draw a mark where he or she thinks it would separate the piece into halves. Then the child folds the piece to check the guess. If the guess is wrong, the child should mark the crease to show halves.

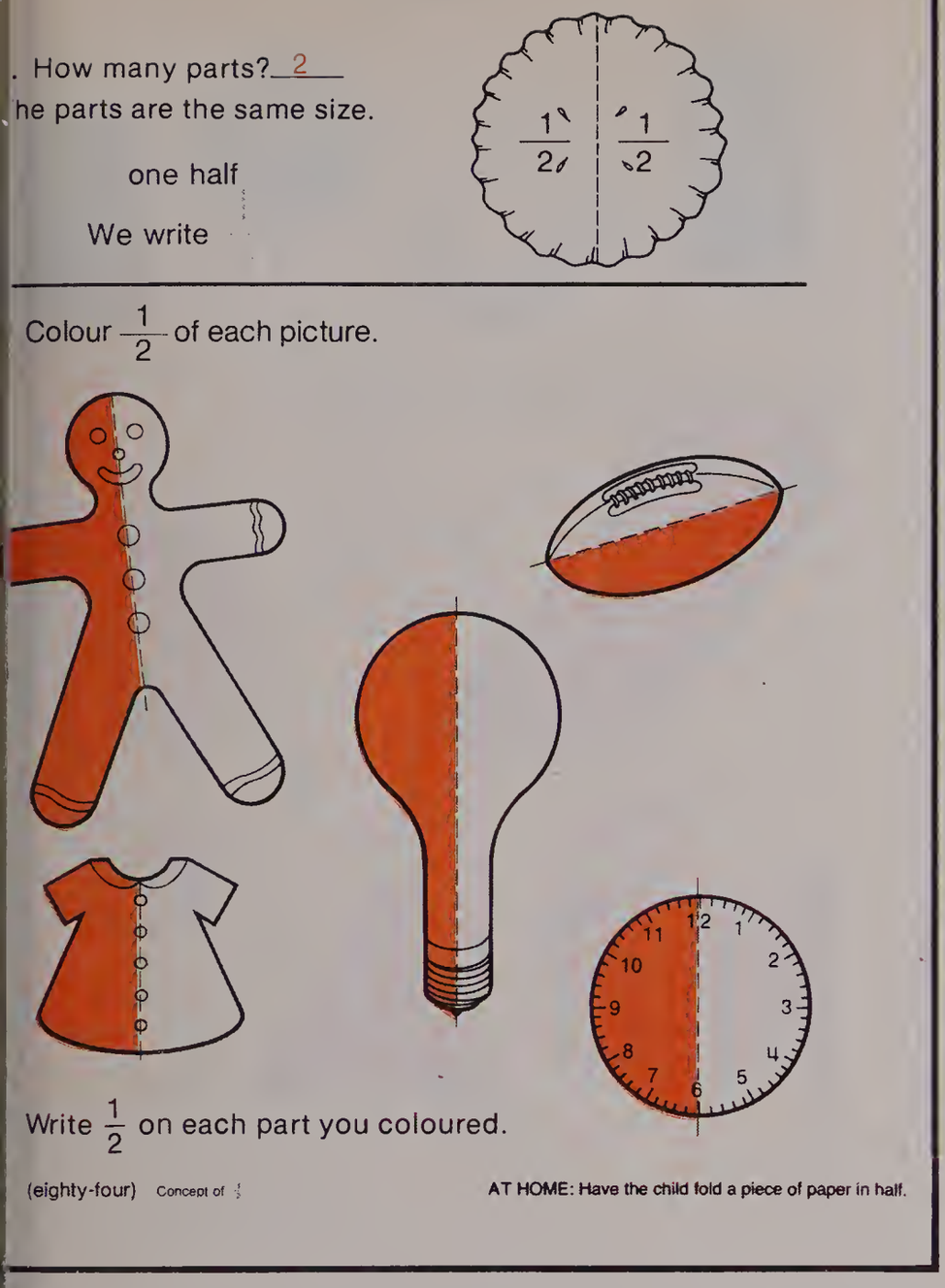
RELATED AIDS

ACT. MASTERS—17.
BFA COMP LAB I—70, 71.



Using the Book Panel 1: Call attention to the orange and the dotted line. Ask "Does the dotted line separate the orange into two parts? (yes) Are the parts the same size? (no) Is the orange separated into halves? (no)" Repeat the questions about the dish, concluding with: "Are the two parts the same size? (yes)" Tell the child to mark a big X on the dish. Continue in this manner for the blue picture and the green picture, having the child mark an X on each picture that is separated into halves by the dotted line (green picture).

Panel 2: Have the child color each picture that shows halves.



sing the Book Panel 1: Call attention to the pie. Ask, "Is the pie cut into two irts? (yes) Are the parts the same size? (yes) Is each part one half of the pie? es)" Have the child read and answer the question. Then have the child read ie half and color half of the pie. Ask the child to trace over the numeral $\frac{1}{2}$.

Panel 2: Have the child color one half of each picture.

Panel 3: Have the child write $\frac{1}{2}$ on the part of each picture that was colored panel 2.

t Home Upon completion of the pupil page, the child may take the page ome and do the At Home activity suggested at the bottom of the page.

OBJECTIVES

To identify $\frac{1}{2}$ of a picture
To color $\frac{1}{2}$ of a picture
To write $\frac{1}{2}$

PACING

Level A	All (1, 3 guided)
Level B	All (1 guided)
Level C	All (1 guided)

VOCABULARY

one half

MATERIALS

paper pie plates

SUGGESTIONS

Initial Activity Show a pie plate with a line separating it into halves. Ask, "How many parts? Are the parts the same size? Does the pie plate show halves?" Explain that each part is one half of the pie plate. Write $\frac{1}{2}$ on the chalkboard. Have the child write $\frac{1}{2}$ on each part of the pie plate.

ACTIVITIES

1. Have the child look at Panel 1 on page 84. Ask, "How many half-pies make a whole pie?"

2. Give the child a sheet of paper to fold in half and draw a picture on half of the paper.

3. Use the activity Number 3 on page 83. For each half shown, have the child write $\frac{1}{2}$ on it.

4. Provide shapes like those in Panel 2, page 84. Have the child fold each shape in halves, then mark the crease and write $\frac{1}{2}$ on each half.

RELATED AIDS

ACT. MASTERS—17.
BFA COMP LAB I—70, 71.

OBJECTIVE

To identify pictures that show thirds

PACING

Level A All (1 guided)
Level B All (1 guided)
Level C All (1 guided)

VOCABULARY

thirds

MATERIALS

paper pie plates

SUGGESTIONS

Initial Activity Show a pie plate cut into thirds. Have the child verify that the parts are the same size. Show a second pie plate separated into thirds by dotted lines. Have the child use one part of the first pie plate and verify that the parts of the second pie plate are the same size. Ask, (for the second pie plate) "How many parts? (3) Are the parts the same size? (yes)" Explain, the dotted lines separate the plate into thirds.

ACTIVITIES

1. Arrange sheets of paper in a pile (some showing thirds, some showing 3 parts not the same size). The child selects a sheet showing thirds for a finger painting activity.

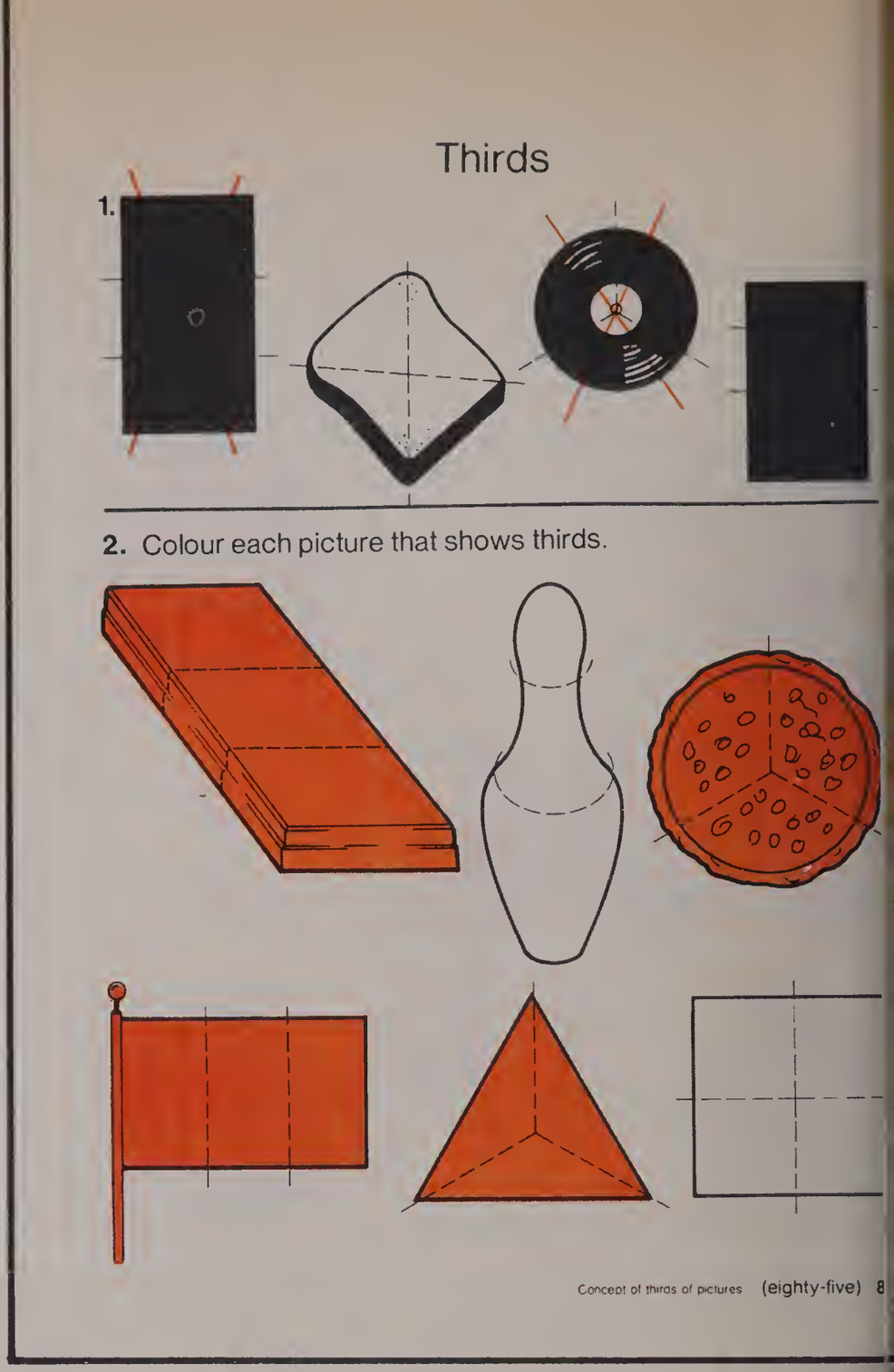
2. Show a sheet of paper separated by dotted lines into three parts that are not the same size. Ask, "Are there 3 parts? (yes) Does the paper show thirds? (no) Why not? (The parts are not the same size.)"

3. Distribute a 5 cm by 15 cm strip of paper. Have the child draw 2 lines to separate the strip into thirds. The work is checked by another strip properly marked by the teacher.

4. Provide an equilateral triangle (all sides the same length) cut from a piece of paper. Have the child draw 3 lines from a point inside the triangle to separate it into thirds.

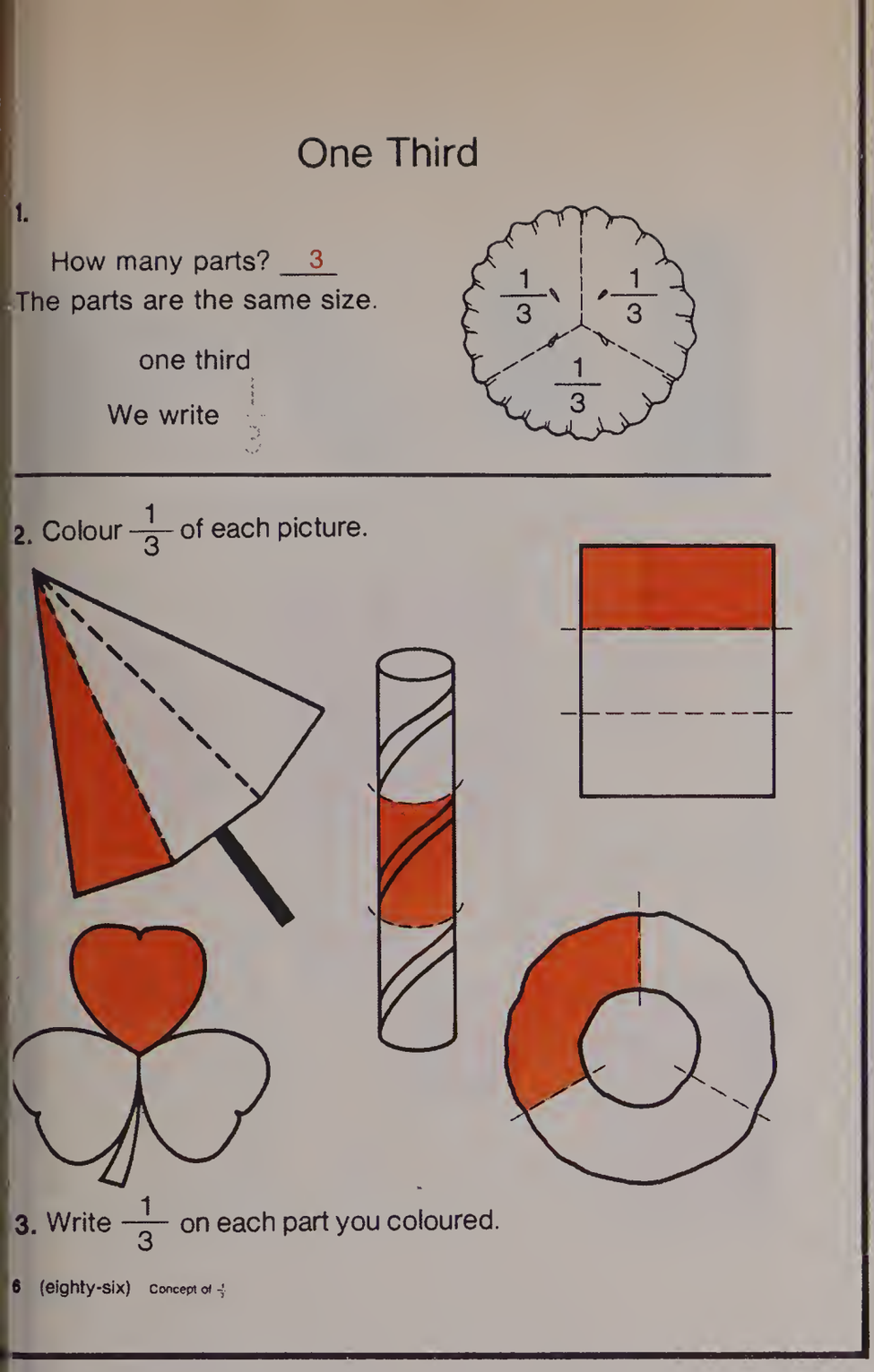
RELATED AIDS

ACT. MASTERS—17.
BFA COMP LAB I—70, 71.



Using the Book Panel 1: Call attention to the purple rectangle. Ask, "Into how many parts do the dotted lines separate the picture? (3) Are the 3 parts the same size? (yes) Does the picture show thirds? (yes)" Tell the child to mark an X on the purple picture, explaining that an X is to be marked on each picture in this panel that shows thirds. Continue in this manner for the other pictures in this panel. Ask, "Why don't the sandwich and the green picture show thirds?"

Panel 2: Have the child color each picture that shows thirds.



Using the Book Panel 1: Have the child read and answer the first question. Then have the child read the second sentence and the word one third. Tell the child to trace over the numeral and then color one third of the pie.

Panel 2: Have the child color one third of each picture.

Panel 3: Have the child write $\frac{1}{3}$ on the part of each picture that has been colored.

OBJECTIVES

To identify $\frac{1}{3}$ of a picture

To color $\frac{1}{3}$ of a picture

To write $\frac{1}{3}$

PACING

Level A	All (1, 3 guided)
Level B	All (1 guided)
Level C	All (1 guided)

VOCABULARY

one third

MATERIALS

paper pie plates

SUGGESTIONS

Initial Activity Show a pie plate cut into thirds. Have the child verify that the parts are the same size. Show another pie plate separated into thirds by dotted lines. Use one part of the first plate and verify that the parts of the second plate are the same size. Ask, for the second pie plate, "How many parts? (3) Are the parts the same size? (yes) Does the pie plate show thirds? (yes)" Explain that each part is one third of the whole plate. Have the child write $\frac{1}{3}$.

ACTIVITIES

1. Refer to panel 1. Ask, "How many thirds of a pie does it take to make a whole pie? (3)"

2. Give the child a strip of paper, 5cm by 15 cm, to fold at 2 places so that the creases separate the paper into thirds. Then have the child draw a line on each crease and write $\frac{1}{3}$ on each part.

3. Provide some circular paper disks with a dot at the center of each disk. Have the child try to separate the disk into thirds by drawing lines and write $\frac{1}{3}$ on each part.

RELATED AIDS

ACT. MASTERS—17.
BFA COMP LAB I—70, 71.

OBJECTIVE

To identify pictures that show fourths

PACING

Level A All (1 guided)
Level B All (1 guided)
Level C All (1 guided)

VOCABULARY

fourths

MATERIALS

red crayon, paper

SUGGESTIONS

Initial Activities 1. Fold a sheet of paper two ways to make creases that separate the sheet into fourths. Color the creases red. Elicit from the child that the red lines separate the sheet into four parts and the parts are the same size. Tell the child the sheet is separated into fourths by the lines.

2. Show a sheet of paper separated into four parts by dotted lines so that the parts are not the same size. Ask, "Are there four parts? (yes) Are they the same size? (no) Is the sheet separated into fourths? (no) Why not? (The parts are not the same size.)"

ACTIVITIES

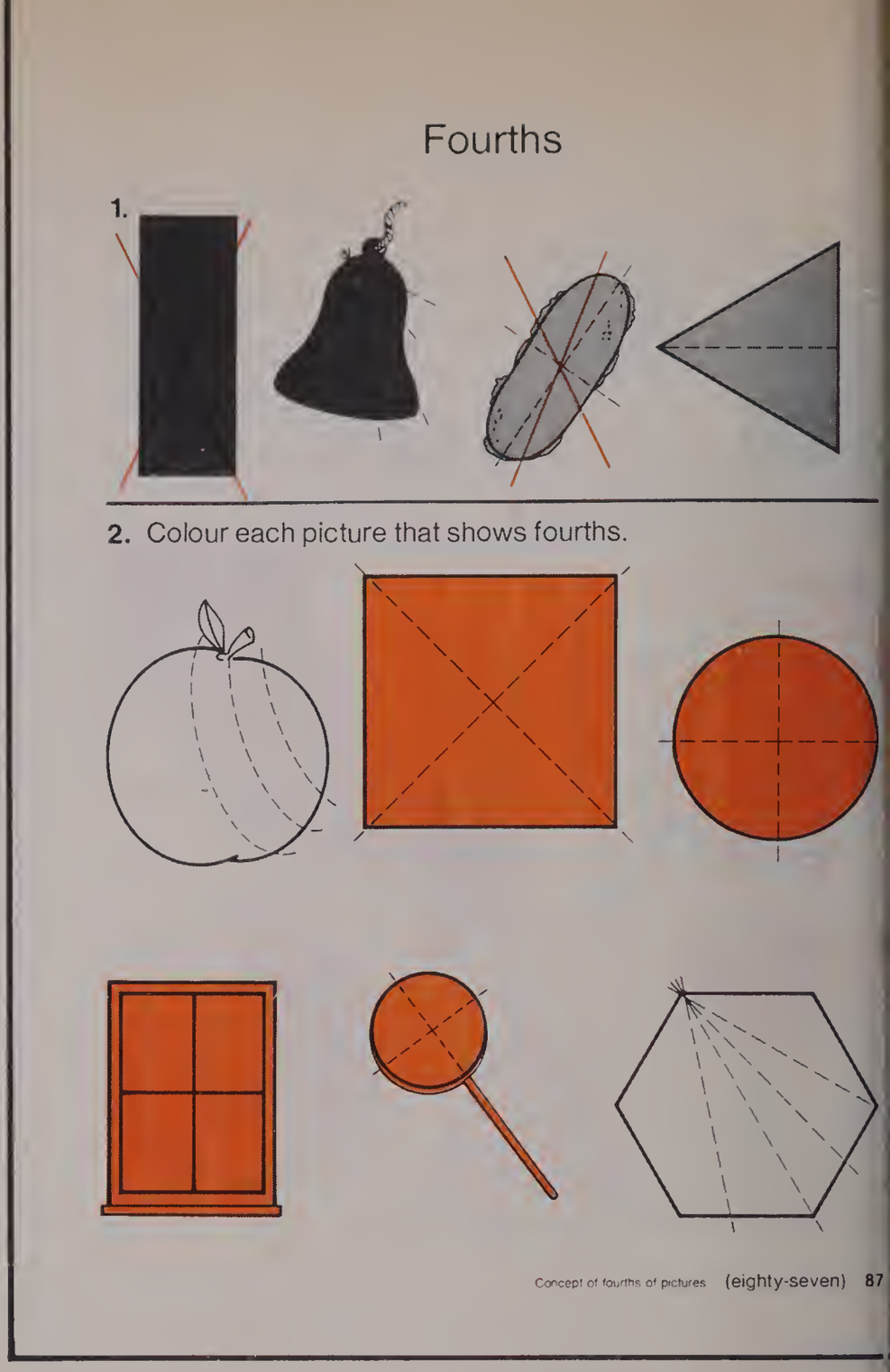
1. Have the child identify pie plates, paper, etc. which show fourths.

2. Show rectangular, square, and circular pieces of paper, some of which are separated into fourths and some not. Have the child identify those that are separated into fourths.

3. Provide 3 square sheets of paper, each about 15 cm by 15 cm. Tell the child to fold the paper so that the creases separate the sheets into fourths. Fold each sheet a different way.

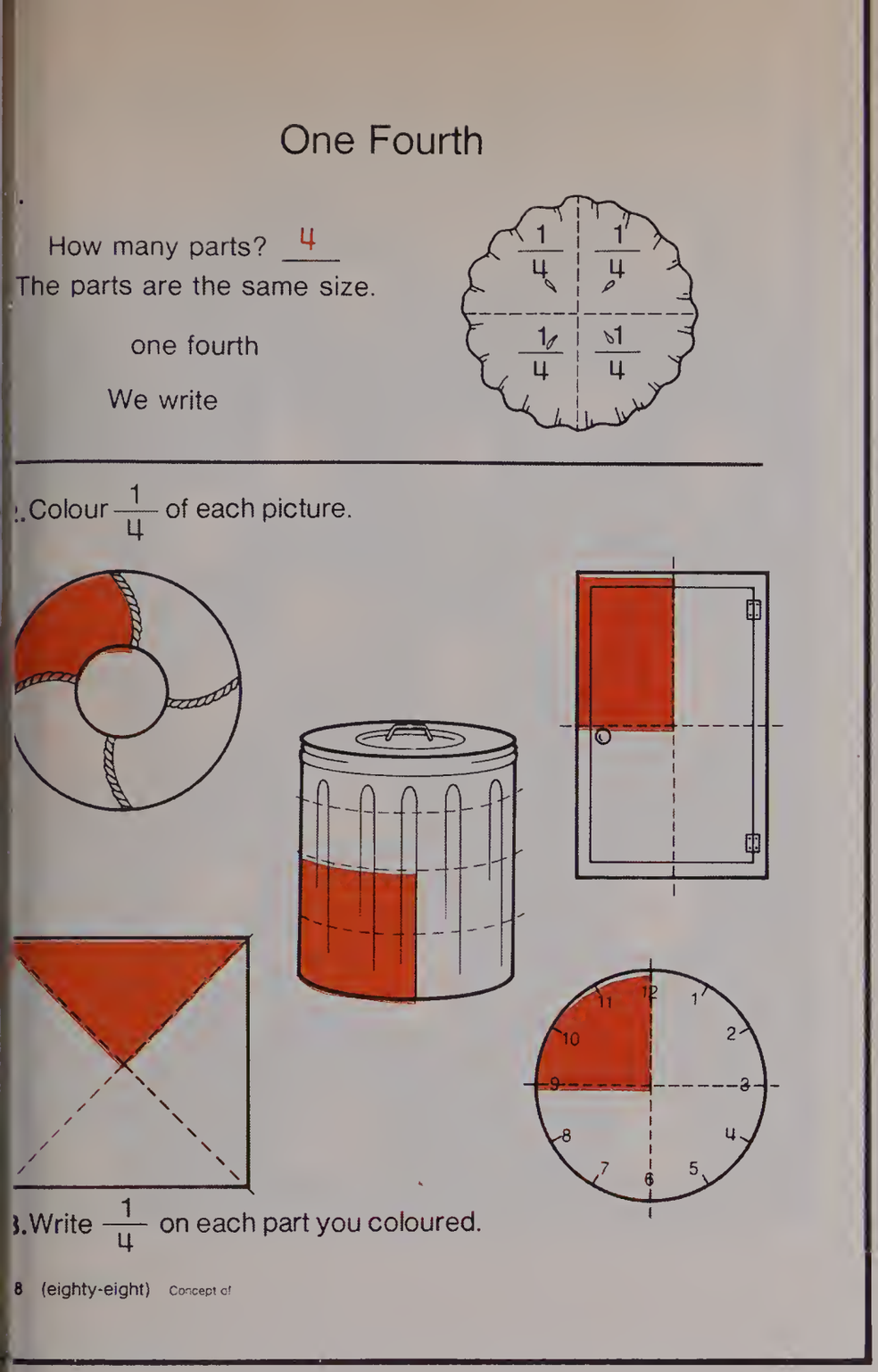
RELATED AIDS

ACT. MASTERS—17.
BFA COMP LAB I—70, 71.



Using the Book Panel 1: Have the child mark an X on each picture that shows four parts that are the same size. Have the child tell why some pictures get an X, others do not.

Panel 2: Have the child color each picture that shows fourths.



Using the Book Panel 1: Call attention to the picture of a pie. Ask, "How many parts in the pie? (4) Are they the same size? (yes) Each part is how much of the pie? (one fourth)" Have the child answer the first question on the page. Then trace over $\frac{1}{4}$ and color one fourth of the pie.

Panel 2: Have the child color one fourth of each picture.

Panel 3: Have the child write $\frac{1}{4}$ on the part of each picture that has been colored.

OBJECTIVES

To identify $\frac{1}{4}$ of a picture
To color $\frac{1}{4}$ of a picture
To write $\frac{1}{4}$

PACING

Level A	All (1, 3 guided)
Level B	All (1 guided)
Level C	All (1 guided)

VOCABULARY

one fourth

MATERIALS

paper pie plates

SUGGESTIONS

Initial Activity Show a pie plate separated into fourths by dotted lines. Ask, "How many parts? (4) Are the parts the same size? (yes) Is the pie plate separated into fourths? (yes)" Explain that each part is one fourth of the plate. Write $\frac{1}{4}$ on the chalkboard and have the child copy it.

ACTIVITIES

1. Show various shapes, some of which are separated into fourths. Have the child identify those separated into fourths and then color one fourth of each.

2. Give the child circular disks or sheets of paper separated into fourths by dotted lines. Have the child color each fourth, 4 different colors.

3. Involve the child in Bulletin Board suggestion 4 in the Chapter Overview.

RELATED AIDS

ACT. MASTERS—17.
BFA COMP LAB I—70, 71.

OBJECTIVE

To add and subtract through sum 9

PACING

Level A All (guided)
Level B All (guided as necessary)
Level C All

SUGGESTIONS

Initial Activity Prepare a sequence of cells similar to: (Answers are in italics.)

4	+3	*7*	−5	*2*	+6	*8*

The child writes the answer for each addition or subtraction in the next empty cell, going from left to right. Each empty cell in the sequence must be filled before going to the next empty cell. Continue until the child understands the procedure.

ACTIVITIES

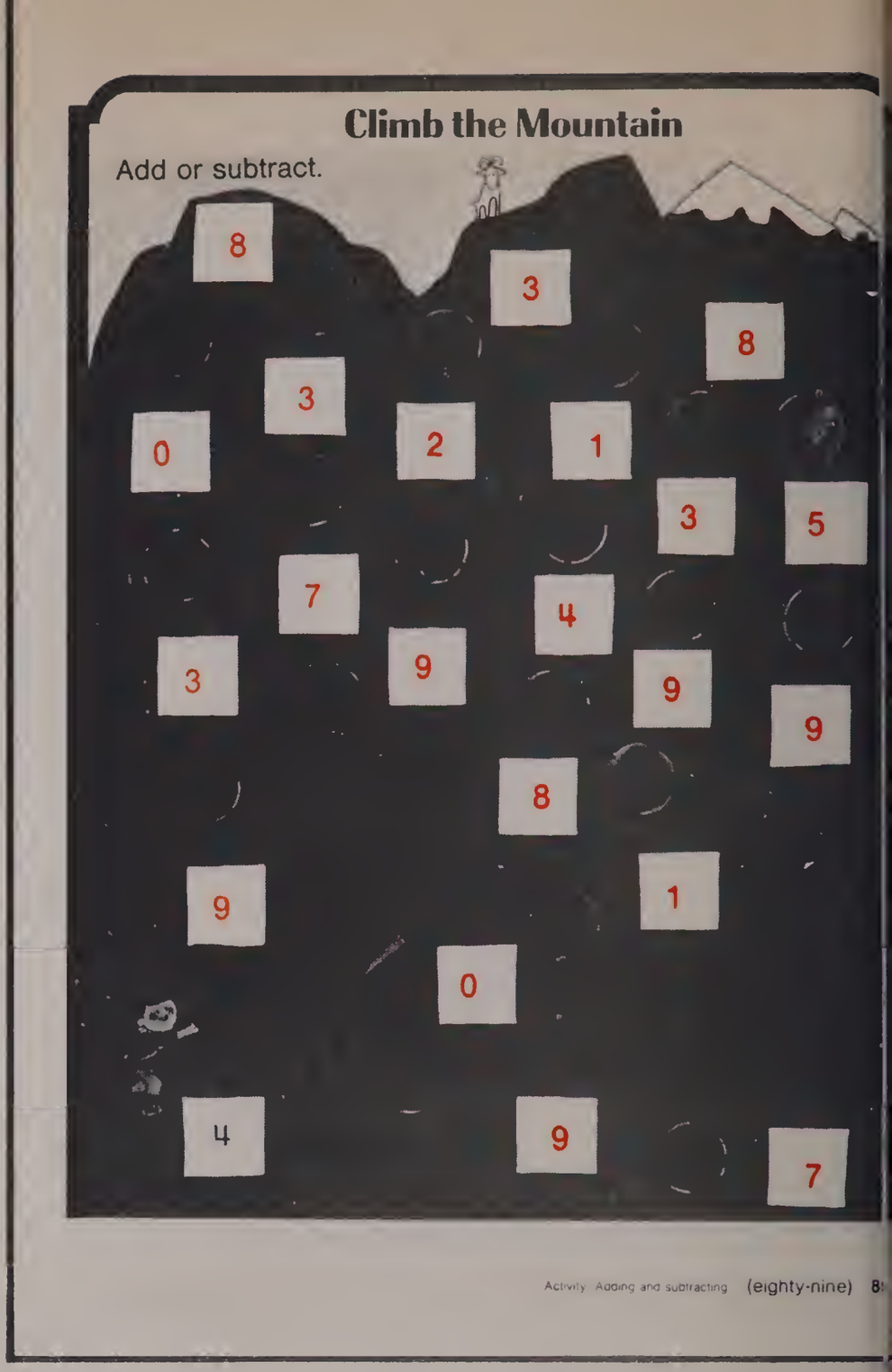
1. Involve the child in a Bingo game. See the Activity Reservoir. Each cell of a Bingo Card should be filled with the answer for an addition or subtraction fact, sums less than 10.

2. Give an oral drill on adding and subtracting. For example, say, "3 add 4 (pause), subtract 6 (pause), add 7 (pause), subtract 4 (pause), what is the answer?" (4)

3. Prepare a Basic Fact Wheel, as described in the Activity Reservoir, for subtracting from numbers less than 11. Challenge the child to give the differences. (Include exercises for subtracting from 10.)

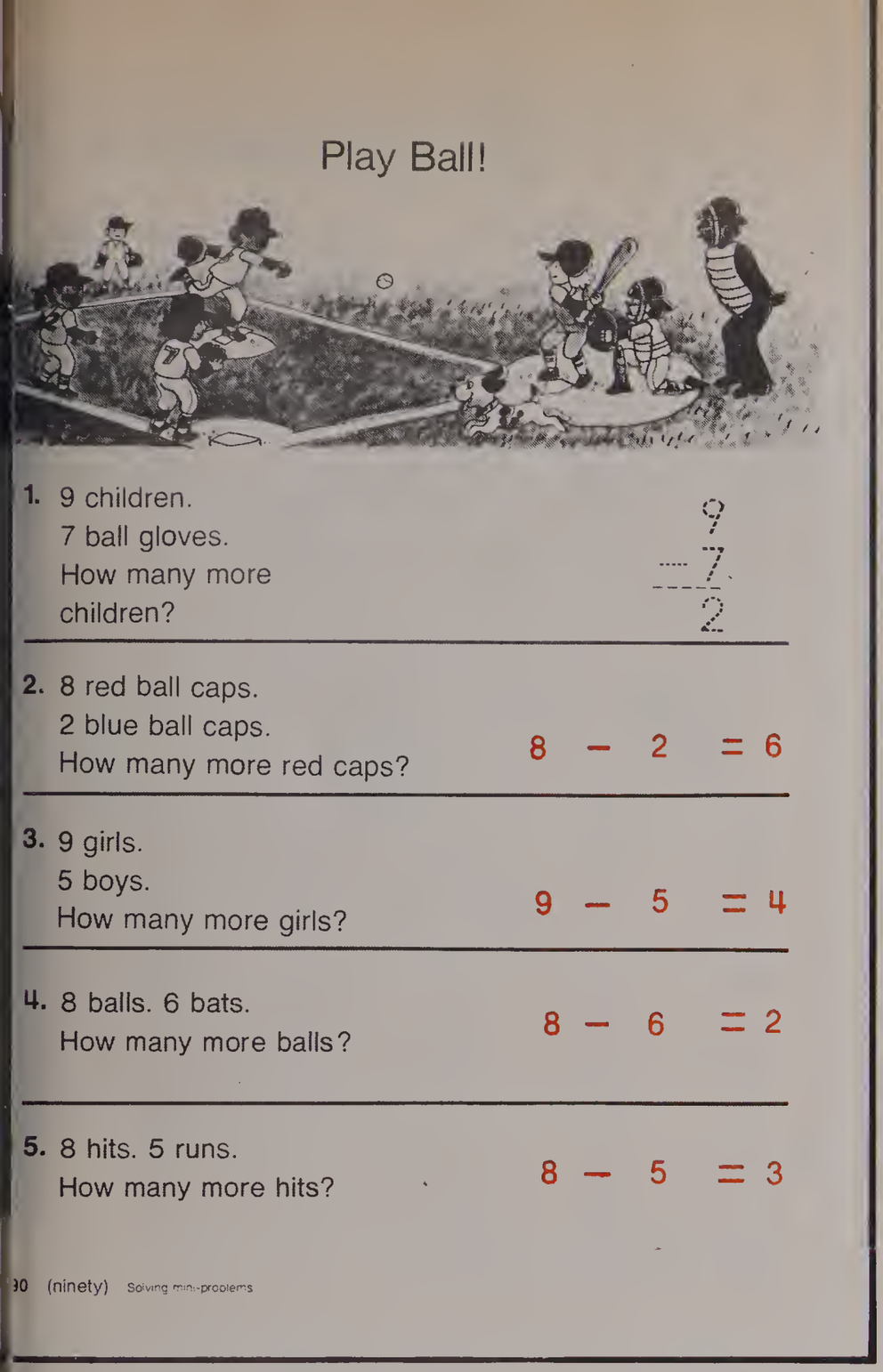
RELATED AIDS

ACT. MASTERS—18.
—Seasonal 1-4.
—Gen. Use 7-11, 13.
BFA COMP LAB I—8, 9, 46, 47.



Activity Adding and subtracting (eighty-nine) 89

Using the Book Tell the child to "climb" over the mountain. "Start with 4, add 5, write the answer in the square. Continue along the path until you get to the end."



Using the Book Panel 1: Have the child read the problem. Ask, "To answer the question, should we add or subtract? (subtract) Which number should we subtract from? (9) Which number should be subtracted from 9? (7)" Have the child trace the subtraction sentence and write the answer.

Panels 2-5: Have the child read each mini-problem, decide whether to add or subtract, and write the sentence that goes with the problem. Then have the child write the answer.

OBJECTIVES

To solve mini-problems

PACING

Level A	All (1, 2 guided)
Level B	All (1 guided)
Level C	All (1 guided)

SUGGESTIONS

Initial Activities 1. Write a sentence such as 4 ○ 5 = ___. Make up an addition mini-problem to go with the sentence. Write the mini-problem on the chalkboard. Have the child decide whether to add or subtract, give the sum, and answer the question in the problem.

2. Repeat the above activity for a subtraction sentence such as 8 ○ 6 = ___ You may have the child give a mini-problem for each of these situations: take away; comparing; how many more are in one set than in another set.

ACTIVITIES

1. Prepare mini-problems for the worktable. Have the child work with some of them.

2. Some children can tell about experiences in a Little League. Have these children make up mini-problems related to their experiences. Write these problems on index cards and place them on the worktable for other children to solve.

3. Three children may play a game making up mini-problems for the worktable. The children take turns. The first child writes a sentence, such as: 6 birds on the fence. The second child writes the second sentence, such as: 2 more birds came (or 2 birds flew away). The third child writes the question: How many in all? (or How many are left?) Then the first child writes the number sentence that goes with the problem; the second child writes the sum or difference; and the third child answers the question in the problem.

RELATED AIDS

ACT. MASTERS—Seasonal 5.

OBJECTIVES

To review and maintain the following drills:
To add sums to 9 [71]
To subtract from 9 and less [76]

PACING

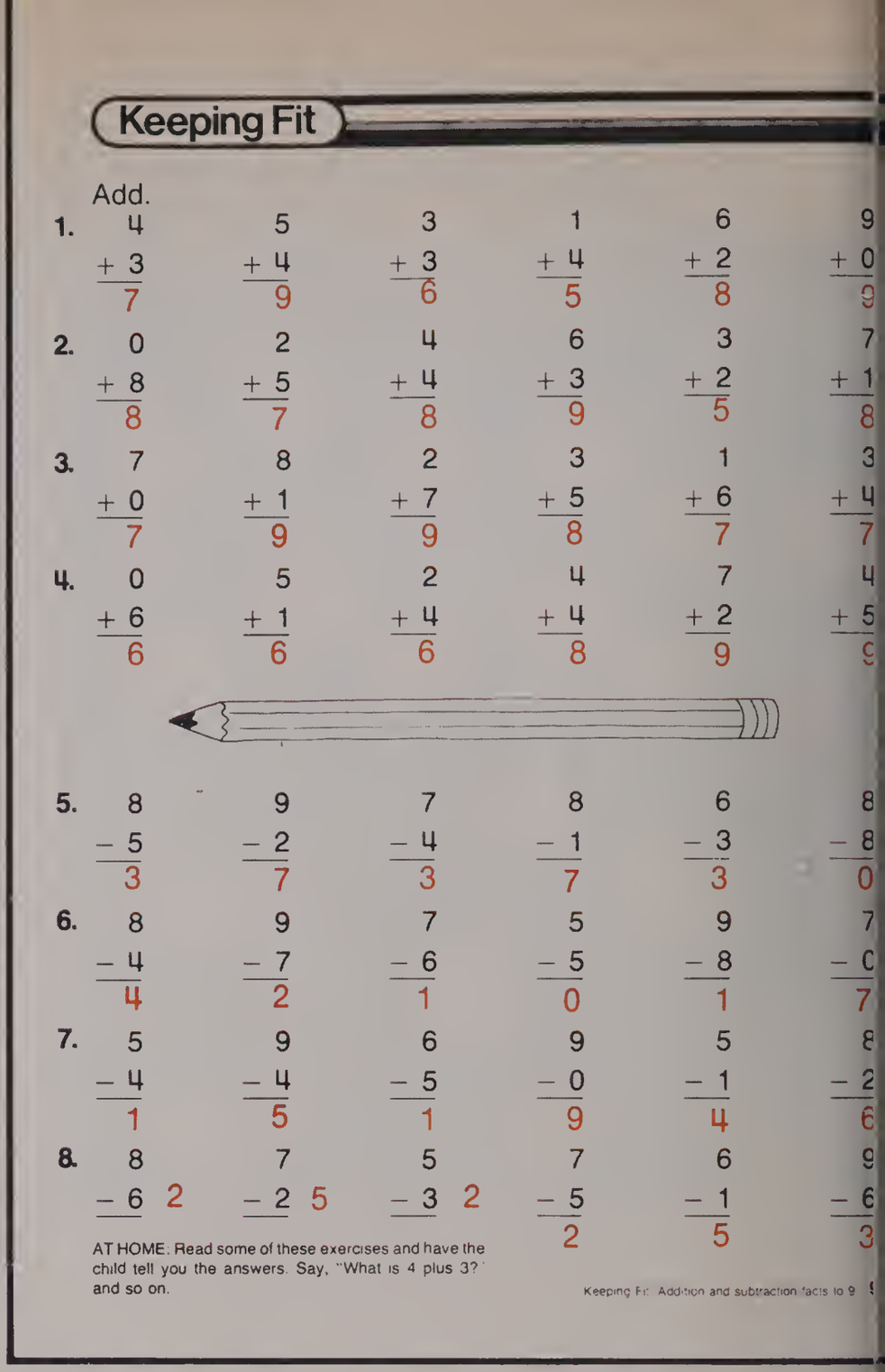
Level A	All
Level B	All
Level C	All

SUGGESTIONS

If children have unusual difficulty with the exercises on this page, you could provide appropriate remedial work. The page references following the objective are keyed to the lesson in which the concept is taught.

RELATED AIDS

ACT. MASTERS—18.
—Seasonal 1-4.
—Gen. Use 7-11, 13.
BFA COMP LAB I—8, 9, 46, 47.



Keeping Fit

Add.

1.	4 + 3 = 7	5 + 4 = 9	3 + 3 = 6	1 + 4 = 5	6 + 2 = 8	9 + 0 = 9
2.	0 + 8 = 8	2 + 5 = 7	4 + 4 = 8	6 + 3 = 9	3 + 2 = 5	7 + 1 = 8
3.	7 + 0 = 7	8 + 1 = 9	2 + 7 = 9	3 + 5 = 8	1 + 6 = 7	3 + 4 = 7
4.	0 + 6 = 6	5 + 1 = 6	2 + 4 = 6	4 + 4 = 8	7 + 2 = 9	4 + 5 = 9

5.	8 − 5 = 3	9 − 2 = 7	7 − 4 = 3	8 − 1 = 7	6 − 3 = 3	8 − 8 = 0
6.	8 − 4 = 4	9 − 7 = 2	7 − 6 = 1	5 − 5 = 0	9 − 8 = 1	7 − 0 = 7
7.	5 − 4 = 1	9 − 4 = 5	6 − 5 = 1	9 − 0 = 9	5 − 1 = 4	8 − 2 = 6
8.	8 − 6 = 2	7 − 2 = 5	5 − 3 = 2	7 − 5 = 2	6 − 1 = 5	9 − 6 = 3

AT HOME: Read some of these exercises and have the child tell you the answers. Say, "What is 4 plus 3?" and so on.

Keeping Fit: Addition and subtraction facts to 9

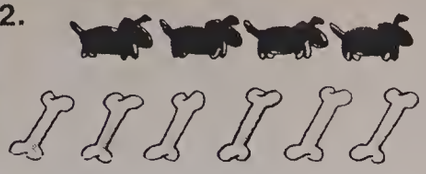
Using the Book Panels 1-4: Tell the child to add
Panels 5-8: Have the child subtract

At Home Upon completion of the pupil page, the child may take the page home and do the At Home activity suggested at the bottom of the page.

1.

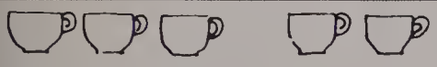
How many more doors?

4 − 2 = 2

2. 

How many more bones?

6 − 4 = 2

3. 

How many cups in all?

3 + 2 = 5

What part is red? Ring the numeral.

4.

$\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$

5.

$\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$

6.

$\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$

7. Add

6	2	9
+ 3	+ 7	+ 0
9	9	9
1	5	6
+ 8	+ 4	+ 2
9	9	8
7	5	4
+ 2	+ 3	+ 4
9	8	8

8. Subtract.

8	9	8
− 1	− 4	− 2
7	5	6
8	9	9
− 7	− 2	− 9
1	7	0
9	8	8
− 0	− 5	− 6
9	3	2

Using the Book This is a diagnostic test. The page references are given for re-teaching as needed. The letter indicates the objective.

Panels 1-3: Have the child give the number of each object in each panel, decide whether to add or subtract, and write the minus or plus sign in the ring. Then the child completes each sentence. [page 80 B]

Panels 4-6: For each panel, have the child decide how much of the pie is coloured red. Then, have the child ring that numeral below the pie. [pages 84-88 C]

Panel 7: Tell the child to add. [page 71 A]

Panel 8: Have the child subtract. [page 76 A]

OBJECTIVE

To evaluate achievement of the Chapter Objectives

PACING

Level A All
Level B All
Level C All

SUGGESTIONS

The Chapter Test is designed to be used in a diagnostic manner. It assesses the child's knowledge of the main concepts and skills that were taught in this chapter. Some children should take this test independently with guidance for instructions only. Use judgment as to whether certain children should be guided through some or or all of the exercises. Check each child's work and mark the items that are incorrect. Reteaching or extra practice might be necessary to help the child acquire the concept or skill that was missed. With this reteaching, you will be able to ascertain whether the child has then learned the topic in question. See Using the Book for page references indicating where the concept or skill was taught.

ACTIVITIES

1. Provide beans, buttons, etc. and addition practice cards for sums 9 and less. Have the child spread the cards and arrange the objects to represent each sum. The child writes the exercises and the sum.

2. You may wish to have a group activity. Select 2 teams. Use the Basic Fact Wheels described in the Activity Reservoir to review sums and differences through 9.

3. Let the child play Button Toss to practice adding 3 numbers. See Activity Reservoir.

CHAPTER 6 OVERVIEW

This chapter teaches addition and subtraction of two-digit numbers. A place value chart is used first to emphasize place value; then the short form is taught. The art theme of this chapter is the Zoo.

OBJECTIVES

A To use place value chart to write two-digit numerals
B To add with two-digit numerals, no regrouping
C To subtract with two-digit numerals, no regrouping
D To add and subtract, sums 10 and less
E To solve mini-problems

BACKGROUND

1. Now that the child is encountering basic facts with greater sums, he/she should be encouraged to find differences by considering known related additions. This technique is even more important in the following units for basic facts with sums greater than ten.

Following is an addition and subtraction family.

$6 + 4 = 10$ $\quad$ $10 - 4 = 6$
$4 + 6 = 10$ $\quad$ $10 - 6 = 4$

The following items concerning this family may be stressed

a) The only numbers in the four sentences are 4, 6, and 10.
b) 4 and 6 are addends in the addition sentences and 10 is the sum.
c) The subtractions show that we may subtract either addend from the sum and get the other addend.

2. Addition involving two-digit numerals is introduced in conjunction with a place value chart.

Add

tens	ones
3 4	5 1

This type of chart emphasizes place value. It is recommended in the early stages that children, when using the short form, give each place value when finding the sum. For example, in finding the sum in the short form above, a child may say "5 ones plus 1 one is 6 ones; 3 tens plus 4 tens is 7 tens."

MATERIALS

9 full ten-boxes
10 blocks
flannel board and coloured disks
problems on file cards, see pages 104 and 106
addition and subtraction practice cards, through sum 10
set of cards with two, three, and five members

CAREER AWARENESS

Veterinarians [111]

Veterinarians are animal doctors. Most veterinarians treat small animals or pets in animal hospitals or in private practice. Others specialize in large animals such as cattle or horses and work directly on farms or ranches. These doctors might perform surgery, prescribe drugs, or administer vaccines. Some veterinarians may teach or do research related to animal diseases.

It is important that children develop an awareness of self and others. Children should realize that veterinarians, like other doctors, preserve health and save lives. Veterinarians must have an understanding of a farmer's or rancher's needs to properly care for their animals. An owner of a farm or ranch animal and also a pet owner rely on a veterinarian to care for their animals.

Photo description: This Cretan wild goat was born with misshapen hind legs. The veterinarian corrected them with surgery and put casts on its legs. The casts are covered with elasticized burlap bandages.

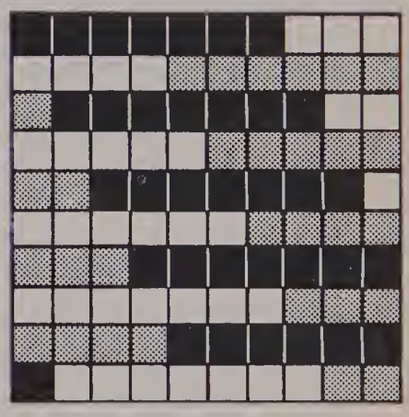
BULLETIN BOARD

1. The theme of this chapter is the zoo. Since children at this age love the zoo and its animals, assist them in creating a bulletin board around this theme. You might list several tasks that the children might like to participate in, such as (1) drawing pictures of animals seen at the zoo, (2) writing stories about trips to the zoo or the animals and, (3) creating mini-problems involving addition and subtraction.

2. Construct two large circles on the bulletin board with ample space between them. Place several vertical addition cards for sums to 10 (the majority of cards should involve sum 10) inside one circle. Attach a piece of yarn to each card. Place the numeral card for 10 inside the other circle. The child uses the yarn to match each number sentence for sum 10 with the numeral 10.

You might tack two plastic bags to the lower edge of the bulletin board. Label one bag "sum 10" and place all the addition cards for sum 10 in it. Label the second bag "subtracting from 10" and place all the subtraction cards for sum 10 in it.

3. You might duplicate the following pattern on a large chart:



Explain to the child that each row and column contains ten squares. The squares are colored either black, gray, or white. Have the child number a piece of paper from 1 to 10 vertically. Challenge the child to examine each row of squares and then write the two-addend or three-addend number sentence illustrated by the color pattern.

SPECIAL NOTE

Color is used as an aid in visualizing the addition and subtraction operations for two-digit numbers. When ten-boxes and single blocks are used for illustrating addition, each addend is represented by a different color. For subtraction, all boxes and blocks are the same color. X's are used to represent taking away.

OBJECTIVE

To add tens, no regrouping

PACING

Level A	All (1-2 guided)
Level B	All (1-2 guided)
Level C	1, 3 (1 guided)

MATERIALS

8 ten-boxes

SUGGESTIONS

Initial Activity Show 3 ten-boxes and 5 ten-boxes. Ask the child to tell how many blocks are in each set and how many blocks there are in all. Write:

3 tens	30
5 tens	+50
___ tens	

Relate the addition on the left to joining the two sets. Have the child verify that the addition on the right is the same. Then have the child give the sum.

ACTIVITIES

1. Two children may play the computer game. One child is the input and reads addition exercises from the practice cards, sums 9 and less. The other child, the output, gives the sum each time. The children take turns being the input and the output.

2. Have one child read exercises such as "6 tens plus 2 tens." Other children write the problem in short form and solve it at the chalkboard.

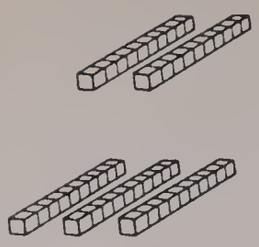
3. Give the child oral practice on adding tens. Say, "3 tens plus 4 tens are how many tens? (7 tens)" The child gives the answer and writes the short form.

RELATED AIDS

ACT. MASTERS—19.
BFA COMP LAB I—16, 21, 22.

Adding Tens

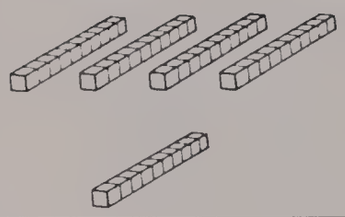
1.



Add.

2 tens	20
3 tens	+30
5 tens	50

2.



Add.

4 tens	40
1 ten	+10
5 tens	50

3. Add.

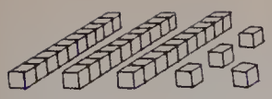
10	30		20	4
+10	+30		+70	+4
20	60		90	8(
50	40		50	3
+40	+30		+30	+6
90	70		80	9(
80	70	60	50	4
+10	+10	+10	+10	+1
90	80	70	60	5(

Using the Book Panel 1: Ask the child to ring the yellow ten-boxes; then the green ten-boxes. Tell the child to find how many ten-boxes there are in all. Ask, "How many yellow ten-boxes? (2) How many green ten-boxes? (3) Two tens plus three tens is equal to how many tens? (5)" Then have the child complete the first addition. Relate the short form, 20 + 30, to the first addition and have the child give and trace the sum. The child may check the answer by comparing it with the sum (5 tens) in the first addition.

Panel 2: Adapt the procedures for panel 1.

Panel 3: Tell the child to add.

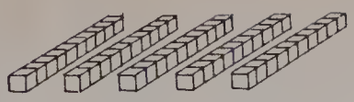
Place-Value Chart



3 tens 4 ones

tens	ones
3	4

34



5 tens (0 ones)

tens	ones
5	0

50

. Complete each place-value chart.

28

tens	ones
2	8

49

tens	ones
4	9

70

tens	ones
7	0

16

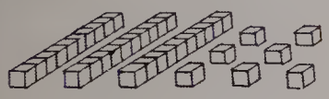
tens	ones
1	6

. Write the numeral.

tens	ones	numeral
2	6	26
1	4	14
8	0	80

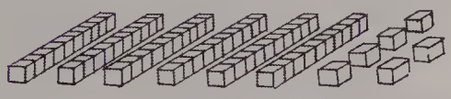
tens	ones	numeral
9	1	91
4	0	40
3	5	35

Complete.



tens	ones
3	7

37



tens	ones
6	6

66

(ninety-four) Place-value chart

sing the Book Display Panel: Ask the child to circle the ten-boxes, then e one-blocks. Ask, "How many ten-boxes?" (3) How many one-blocks?) Have the child find the place in the chart where the ten-boxes are indi- ted. Ask, "How do we know from the chart that the 3 means tens?" (tens n top) Have the child indicate where the number of one-blocks is repre- nted. Ask, "What number is 3 tens and 4 ones?"

Repeat the procedure for the set of 5 ten-boxes.

Panel 1: Have the child read the numeral to the left of the place-value art. (28) Ask, "How many tens?" Have the child trace the 2 in the tens x. Ask, "How many ones?" Have the child trace the 8 in the ones box. ave the child read the numerals and fill in the charts for 49, 70 and 16.

Panel 2: Ask, "2 what? (tens) 6 what? (ones) 2 tens and 6 ones are hat number? (26)" Have the child trace the 26. Repeat the procedure for e remainder of the charts.

Panel 3: Adapt the procedures for the Display Panel.

RELATED AIDS

ACT. MASTERS—19.
—Seasonal 6.

OBJECTIVE

To know tens and ones place in two-digit numerals
To use place value chart for tens and ones

PACING

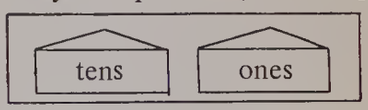
Level A (1-4 guided)
Level B (1-4 guided)
Level C (1-4 guided)

MATERIALS

place value chart, tens strips, ones strips popsicle sticks, dice, matching cards

SUGGESTIONS

Initial Activities 1. Prepare a place value chart from a piece of cardboard and two library card pockets (or envelopes).



Cut out strips of paper (different colors and lengths for tens and ones) that the child can insert into or remove from the pockets.

Put three strips in the ones pocket and two strips in the tens pocket. Ask, "How many ones? How many tens? What number has 2 tens and 3 ones?"

2. Using popsicle sticks or coffee stirrers, have the child bundle sets of sticks to represent various numerals. Use elastics to bundle sets of ten sticks. Write the numeral 17. Ask, "How many tens? How many ones?" Have the child count 1 bundle of 10 sticks and 7 other sticks. When the bundling has been done correctly have the child write the numeral in a place value chart marked as follows:

tens	ones

ACTIVITIES

Have the children work in pairs and play the game "Bigger". Each child needs several place value charts (make on a stencil) and each pair of children needs one die. Have the first player throw the die and enter the numeral in the ones place. The second player throws the die and enters the numeral in the ones place. The children compare numerals and whichever child has the larger number says, "Mine is bigger" and puts an X by the numeral. The players each roll again and enter the numerals in the tens place. "Mine is bigger" gets an X. The person with the most X's after twenty throws wins.

OBJECTIVE

To add ones to tens and ones, using the short form, no regrouping

PACING

Level A 95 All (1-2 guided)
96 All
Level B 95 All (1 guided)
96 All
Level C 95 All (1 guided)
96 All

MATERIALS

6 ten-boxes, 8 blocks

SUGGESTIONS

Initial Activities 1. Show a set of 5 ten-boxes and 2 blocks. Then show a set of 6 blocks. Have the child tell the number of blocks in each set. Write:

Add

Tens	Ones
5	2
	6

52
+ 6

Relate the procedures in finding the sum to joining the sets. Stress that ones are put with ones so we add 2 ones and 6 ones. In short form, we write 6 below the 2 to help us remember to add ones and ones.

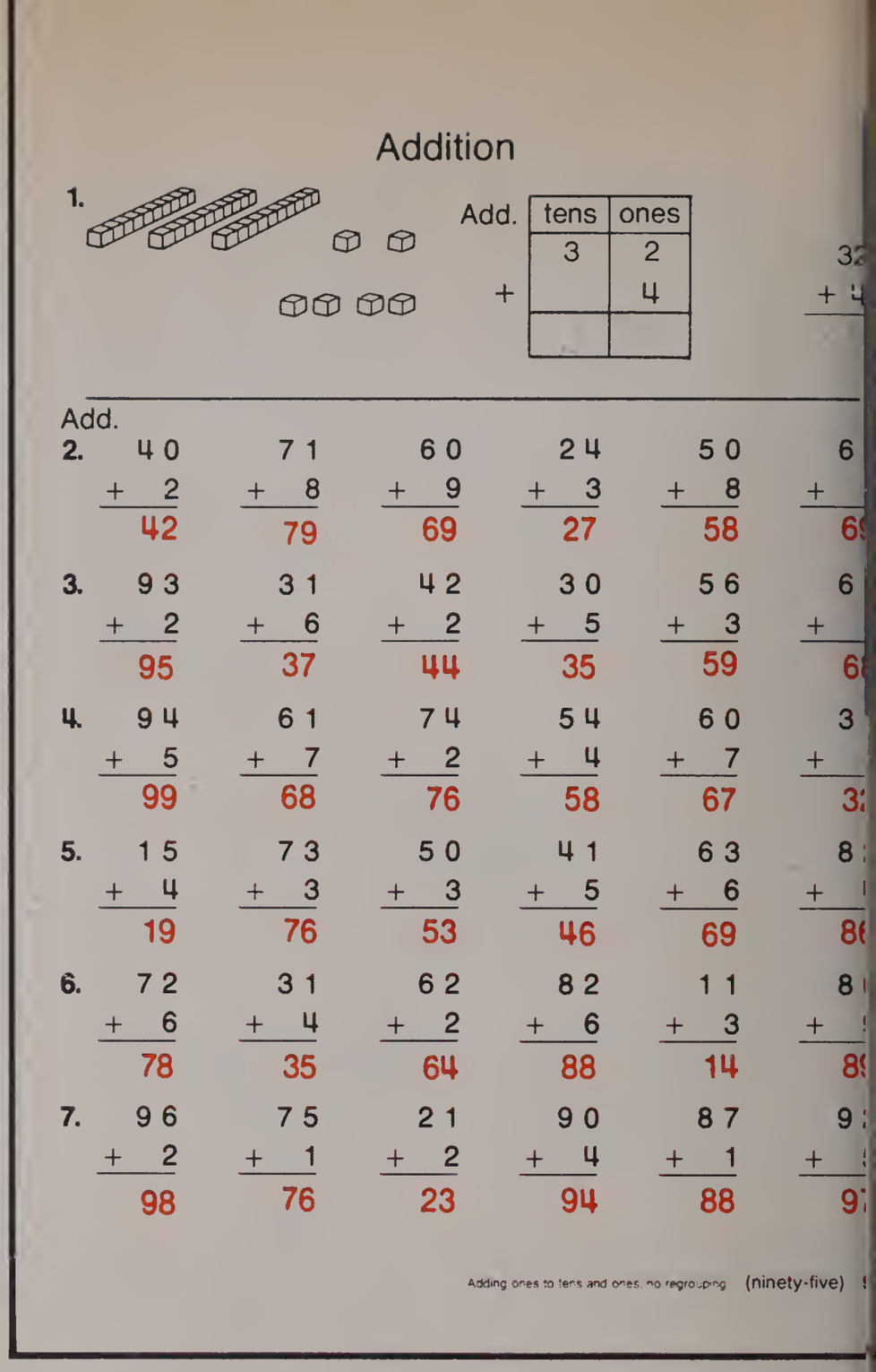
2. Write other exercises as on page 95, Panel 2, and have the child find the sums.

ACTIVITIES

Adapt the game Basic Fact Practice Cards described in the Activity Reservoir. Place the numeral cards for 0 through 9 in a row on the table. Give the child the addition cards, sums 9 and less. Have the child place each basic fact card under the numeral card that shows the answer.

RELATED AIDS

ACT. MASTERS—19.
BFA COMP LAB I—16, 21, 22.



Addition

1.

Add.

tens	ones
3	2
	4

+

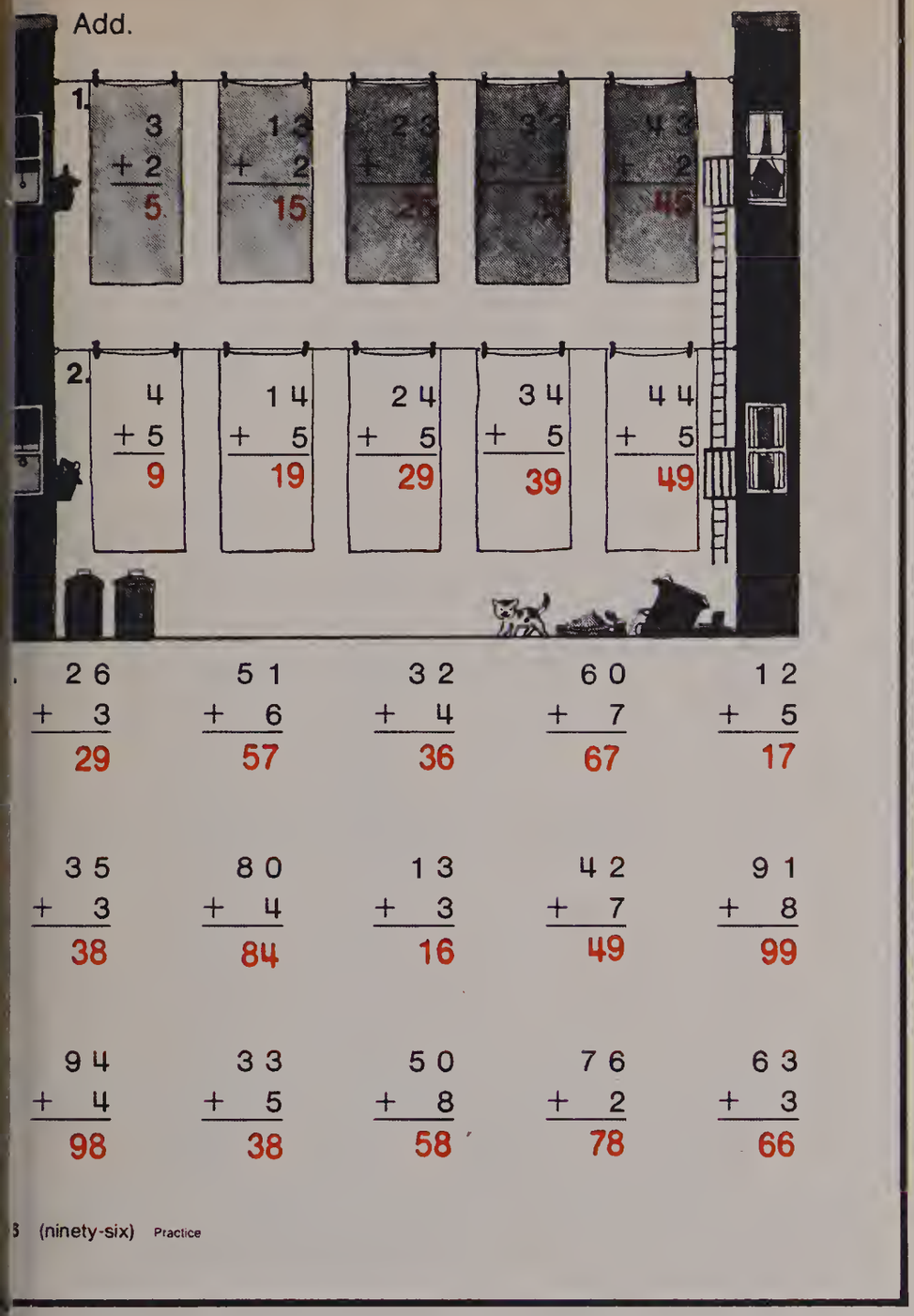
Add.

2.	40	71	60	24	50	6
	+ 2	+ 8	+ 9	+ 3	+ 8	+
	42	79	69	27	58	6
3.	93	31	42	30	56	6
	+ 2	+ 6	+ 2	+ 5	+ 3	+
	95	37	44	35	59	6
4.	94	61	74	54	60	3
	+ 5	+ 7	+ 2	+ 4	+ 7	+
	99	68	76	58	67	3
5.	15	73	50	41	63	8
	+ 4	+ 3	+ 3	+ 5	+ 6	+
	19	76	53	46	69	8
6.	72	31	62	82	11	8
	+ 6	+ 4	+ 2	+ 6	+ 3	+
	78	35	64	88	14	8
7.	96	75	21	90	87	9
	+ 2	+ 1	+ 2	+ 4	+ 1	+
	98	76	23	94	88	9

Adding ones to tens and ones, no regrouping (ninety-five)

Using the Book Panel 1: Ask the child to draw a ring around all the red blocks. Then another ring around the green blocks. The child then gives the numeral for the number of red blocks and finds and traces this numeral in the place value chart. Emphasize the tens section and the ones section of the chart. Ask, "How many green blocks?" (4) Tell the child, "To find how many block there are in all, we add. Do we add the 4 to the ones or the tens?" (ones) Indicate how the place value chart shows this. Then the child may trace and verify that 3 tens + 6 ones is the correct answer. You may draw a ring around all the loose blocks to correspond to adding ones. The child should also draw a ring around the 2, 4 and 6 in the first addition. Then relate the long form addition to the short form on the right. Read "32 plus 4." Ask, "2 plus 4 is what?" Trace 6. Then have the child trace the 3. Ask, "What is the sum?" (36) "Did we add the 4 to the tens or to the ones?" (ones)

Panels 2-7: Tell the child to add.



sing the Book Panels 1-2: Assist the child in completing the first two xercises. Tell the child to add.

After completing panels 1 and 2, describe the patterns in the addends and ıe sums in each row. (The ones digit is the same in each panel, the first addend 10 more each time, so the sum is 10 more each time.) Ask questions such as, What number did you add each time? How do the top numbers vary in each ow? (increase by 10) How do the answers vary? (increase by 10)"

Panel 3: Ask the child to add. Elicit that in each case, the first addend as tens and ones and the second addend has only ones. In every case the sum as the same number of tens as the first addend.

ACTIVITIES

1. Adapt the game Basic Fact Practice Cards, described in the Activity Reservoir. Place the numeral cards for 0 through 9 in a row on the table. Give the child the addition and subtraction cards, sums 9 and less. Have the child place each basic fact card under the numeral card that shows the answer.

2. Involve the child in a Bingo Game as described in the Activity Reservoir. Each cell should have the sum or difference of a basic addition or subtraction fact, sums 9 or less. Read addition and subtraction facts such as: "3 plus 4" and "9 minus 5." The child covers the cell in which each answer appears.

3. Involve the child in a Basketball game. (See the game Baseball in the Activity Reservoir.) For the basketball game, have two stacks of cards. One stack produces one point for each correct answer (free throw) and the other stack produces two points for each correct answer (field goal). The following describes the type of exercises for each stack.

1 point	2 points
35 + 4	35 + 8
(no regrouping)	(with regrouping)

4. Challenge the child with problems such as: John is 5 years older than Sue. In 3 years John will be 10. How old is Sue now? (2)

OBJECTIVE

To add tens and ones, no regrouping

PACING

Level A	97 All (1 guided) 98 All
Level B	97 All (1 guided) 98 All
Level C	97 All (1 guided) 98 All

MATERIALS

7 ten-boxes, 8 blocks

BACKGROUND

See Item 3 in the Chapter Overview Background.

SUGGESTIONS

Initial Activity Show two sets of blocks: 4 full ten-boxes and 2 blocks and 3 full ten-boxes and 6 blocks. Have the child give the expanded numeral and the two-digit numeral for each.

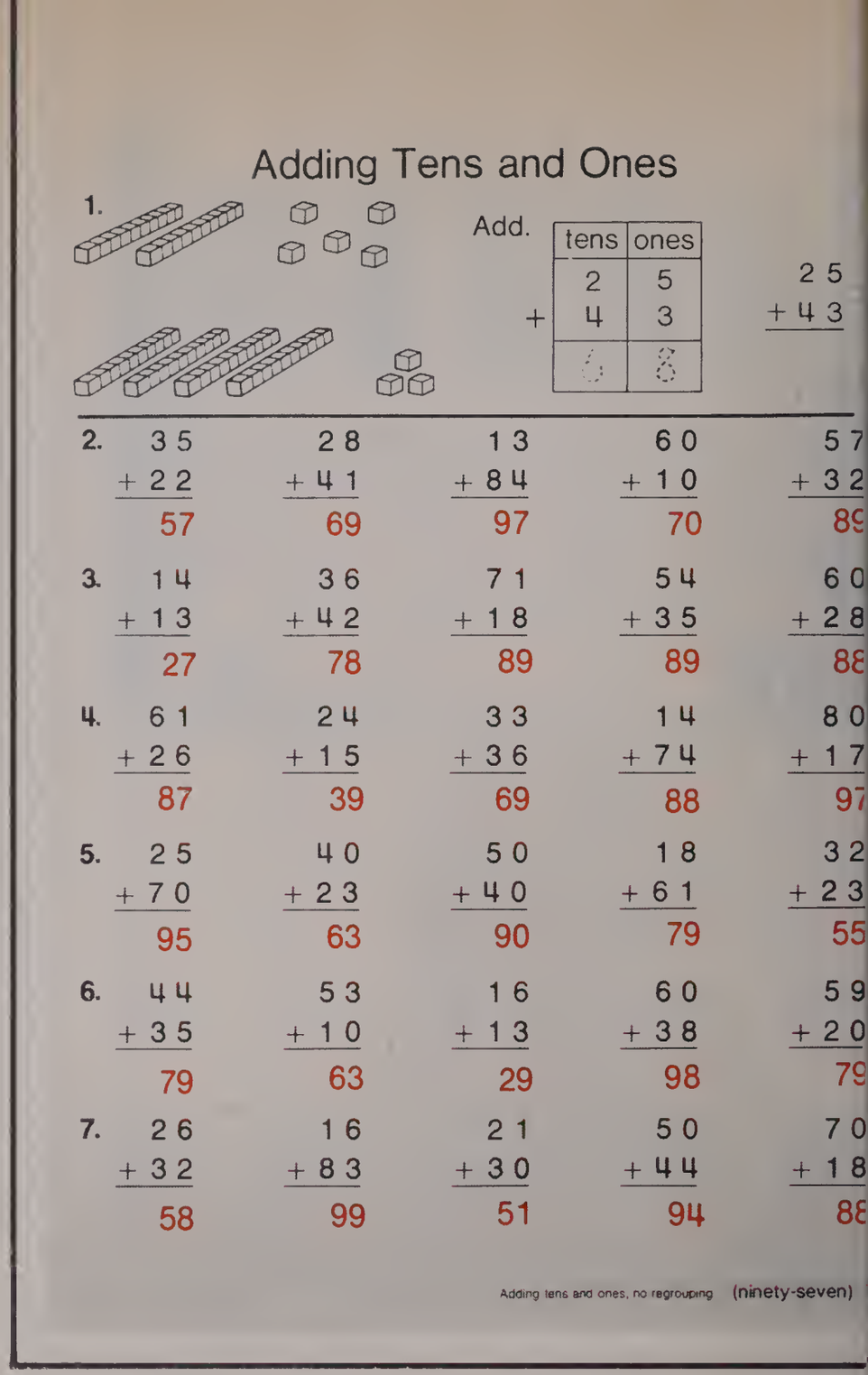
Write exercises similar to those shown in Panel 1 on page 97. Then, by joining first the loose blocks, and then the ten-boxes, find the sum in each form.

ACTIVITIES

Write pairs of exercises, each on a separate card, showing two-digit additions in vertical form. Write each of the sums on separate cards. Have the child pair the answers with the appropriate additions.

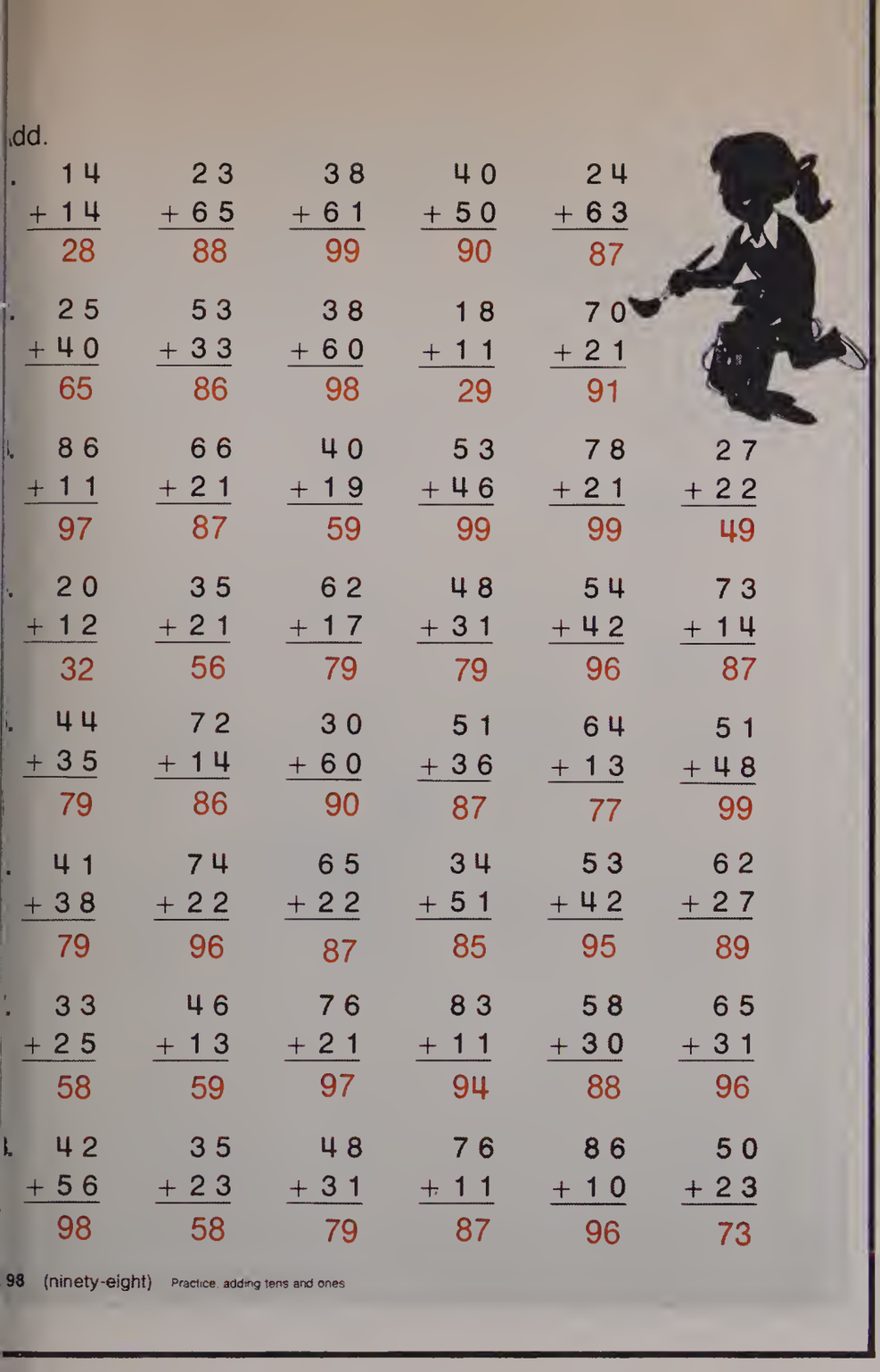
RELATED AIDS

ACT. MASTERS—19.
BFA COMP LAB I—16, 21, 22.



Using the Book Panel 1: Ask the child to give the numeral for the number of each set of blocks and then find and trace this numeral in the place value chart, noting the columns where the digits are placed. Tell the child, "To find how many blocks there are in all, we may add." Call attention to the long form. Ask, "Do the 5 and 3 each mean ones? (yes) What is the sum of 5 ones and 3 ones? (8 ones) Are there 8 loose blocks in all? (yes) Two tens plus four tens are how many tens? (6 tens) Are there 6 ten-boxes in all? (yes)" Have the child trace and read the numeral for the sum. Ask the child to give the two-digit numeral for each addend, then call attention to the short form. Read, "25 plus 43." The child may give the ones digit in each number and then the tens digit. Ask, "What is the sum of the ones? (trace 8) What is the sum of the tens? (trace 6)" Have the child read the two-digit numeral for the sum. Ask, "How many blocks in all? (68)"

Panels 2-7: Tell the child to add.



dd.

. 14 + 14 = 28	23 + 65 = 88	38 + 61 = 99	40 + 50 = 90	24 + 63 = 87	
. 25 + 40 = 65	53 + 33 = 86	38 + 60 = 98	18 + 11 = 29	70 + 21 = 91	
. 86 + 11 = 97	66 + 21 = 87	40 + 19 = 59	53 + 46 = 99	78 + 21 = 99	27 + 22 = 49
. 20 + 12 = 32	35 + 21 = 56	62 + 17 = 79	48 + 31 = 79	54 + 42 = 96	73 + 14 = 87
. 44 + 35 = 79	72 + 14 = 86	30 + 60 = 90	51 + 36 = 87	64 + 13 = 77	51 + 48 = 99
. 41 + 38 = 79	74 + 22 = 96	65 + 22 = 87	34 + 51 = 85	53 + 42 = 95	62 + 27 = 89
. 33 + 25 = 58	46 + 13 = 59	76 + 21 = 97	83 + 11 = 94	58 + 30 = 88	65 + 31 = 96
. 42 + 56 = 98	35 + 23 = 58	48 + 31 = 79	76 + 11 = 87	86 + 10 = 96	50 + 23 = 73

98 (ninety-eight) Practice adding tens and ones

Using the Book Panels 1–8: Tell the child to add.

ACTIVITIES

1. Play Flash Card Sports as described in the Activity Reservoir. Use two-digit additions.

2. Adapt the card activity above. Give two children identical sets of cards to pair correctly for speed.

3. The children may wish to verify some of the exercises on this page with a mini-calculator.

EXTRA PRACTICE

Practice Exercises p. 252 (top)

Tell the child to add.

1.	13 +42 = 55	51 +28 = 79	62 +31 = 93	47 +11 = 58	23 +43 = 66
2.	75 +12 = 87	30 +40 = 70	21 +65 = 86	52 +45 = 97	84 +14 = 98
3.	60 +14 = 74	42 +41 = 83	19 +20 = 39	53 +11 = 64	78 +21 = 99
4.	36 +22 = 58	86 +10 = 96	15 +73 = 88	43 +24 = 67	63 +16 = 79
5.	27 +41 = 68	70 +15 = 85	42 +42 = 84	14 +62 = 76	35 +31 = 66

OBJECTIVE

To subtract tens

PACING

Level A	All (1-2 guided)
Level B	All (1-2 guided)
Level C	1, 3 (1 guided)

MATERIALS

7 full ten-boxes

SUGGESTIONS

Initial Activities Show 7 full ten-boxes. Have the child tell the number of blocks in all. Remove 3 ten-boxes. Ask, "How many blocks are left?" Write:

Subtract	
7 tens	70
3 tens	-30
__ tens	

Relate the subtraction on the left to removing the 3 ten-boxes. Have the child verify that the subtraction on the right is the same; then give the difference in the short form.

Then relate to the place value chart. Show that the zero means "no ones".

tens	ones
5	0
2	0
3	0

ACTIVITIES

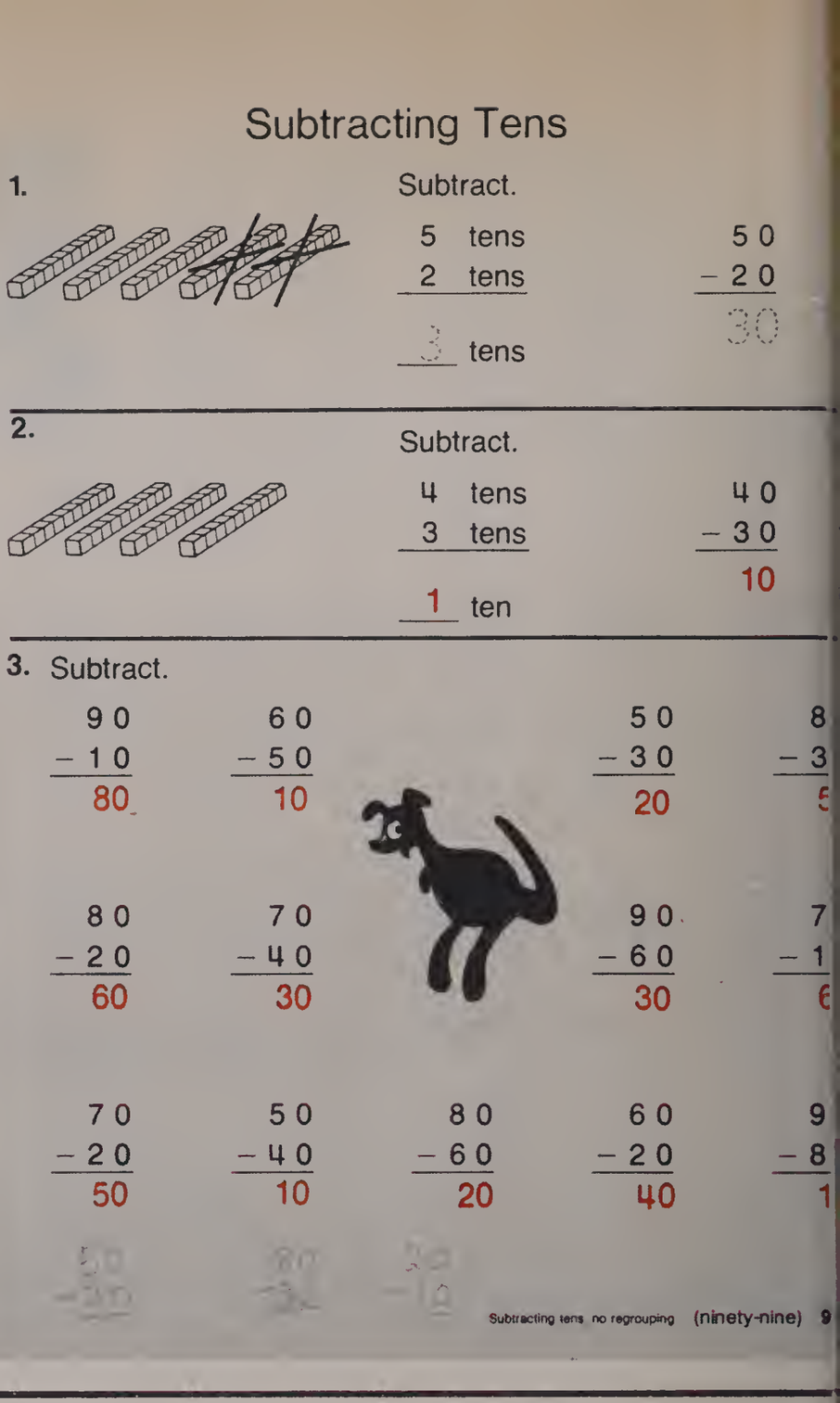
1. Have two children play the computer game. (See page 93 and adapt it for subtraction.)

2. Give oral practice on subtracting tens from tens. Read exercises similar to those on page 99, Panel 3, and have the child give the differences without paper and pencil.

3. Prepare exercises similar to the following:

70 - 20 ○ 50 + 20
50 + 30 ○ 90 - 10
80 - 20 ○ 90 - 70

The child writes >, = , or < in each ring to complete each sentence.



Using the Book Panel 1: Ask, "How many ten-boxes in all? (5) What do the X's mean? (2 ten-boxes are taken away) If we take 2 ten-boxes away, how many ten-boxes are left? (3 ten-boxes)" Relate the picture to the first subtraction exercise and have the child give and trace the answer.

You may have the child draw a mark from the 5 tens to 50 and a mark from the 2 tens to 20. Ask the child to read the short form and give the difference. The child may check the answer by comparing it with the difference (3 tens) in the first subtraction.

Panel 2: Adapt the procedures of panel 1.

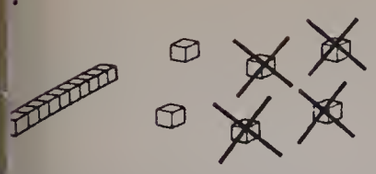
Panel 3: Tell the child to subtract.

RELATED AIDS

BFA COMP LAB I—50, 51.
BFA PROB. SOLVING I—68, 69.

Subtraction

Subtract.



tens	ones
1	6
	4
1	2

16
− 4
12

ubtract.

. 88	39	67	48	76	29
− 3	− 5	− 6	− 1	− 1	− 9
85	34	61	47	75	20
. 16	28	75	99	37	58
− 4	− 7	− 1	− 8	− 1	− 5
12	21	74	91	36	53
. 64	99	77	18	85	89
− 3	− 3	− 5	− 2	− 5	− 2
61	96	72	16	80	87
. 26	68	15	49	64	78
− 5	− 6	− 2	− 7	− 2	− 4
21	62	13	42	62	74
. 17	29	36	47	88	75
− 4	− 6	− 3	− 2	− 8	− 4
13	23	33	45	80	71
. 59	26	47	45	17	39
− 1	− 2	− 7	− 3	− 3	− 4
58	24	40	42	14	35

) (one hundred) Subtracting ones from tens and ones, no regrouping

sing the Book Panel 1: Ask, "How many ten-boxes? (1) How many blocks?) What is the numeral for the number of blocks? (1 ten + 6 ones) Say, "Find ıe numeral in the place value chart and trace it." Emphasize the meaning of ıe tens and ones boxes. What do the X's mean? (take away)" Elicit that we ant to take away 4 blocks and we subtract to find how many are left. Ask, When we take away 4 blocks, do we subtract 4 from tens or from ones? ones) Find and trace the 4 in the ones box." Have the child complete the ıbtraction. The child can check to see that the number of blocks left is ten + 2 ones. Then read the short form, "16 minus 4," and relate the ıbtraction in the long form to the short form.

Panels 2-7: Tell the child to subtract.

OBJECTIVE

To subtract ones from tens and ones using the short form, no regrouping.

PACING

Level A All (1 guided)
Level B All (1 guided)
Level C All (1 guided)

MATERIALS

1 ten-box, 7 blocks

SUGGESTIONS

Initial Activities 1. Show 1 ten-box and 7 blocks. Have the child tell the number of blocks in all. Write:

Subtract.

tens	ones
1	7
	3
1	4

17
− 3

Relate the subtraction exercises to removing 3 blocks from the set. Have the child complete each subtraction exercise.

2. Give the child practice on other exercises similar to those in panel 2 on page 100.

ACTIVITIES

To provide practice in subtracting from numbers 9 or less, give the child the appropriate jig-saw puzzle subtraction practice cards to fit together. (See teacher's page 31.)

RELATED AIDS

BFA COMP LAB I—50, 51.
BFA PROB. SOLVING I—68, 69.

OBJECTIVE

To practice subtracting ones from tens and ones using the short form, no regrouping.

SUGGESTIONS

Initial Activities 1. Show 1 ten-box and 7 blocks. Have the child tell the number of blocks in all. Write

Subtract

Tens	Ones
1	7
	- 3

$$\begin{array}{r} 17 \\ -\ 3 \\ \hline \end{array}$$

Relate the subtraction exercises to removing 3 blocks from the set. Have the child complete each subtraction exercise.

ACTIVITIES

1. To provide practice in subtracting from numbers 9 or less, give the child the appropriate jig-saw puzzle subtraction practice cards to fit together. (See teacher's page 31.)

2. Give the child the subtraction practice cards, subtracting from 9 or less. Tell the child to make stacks so that for each stack all the cards have the same difference.

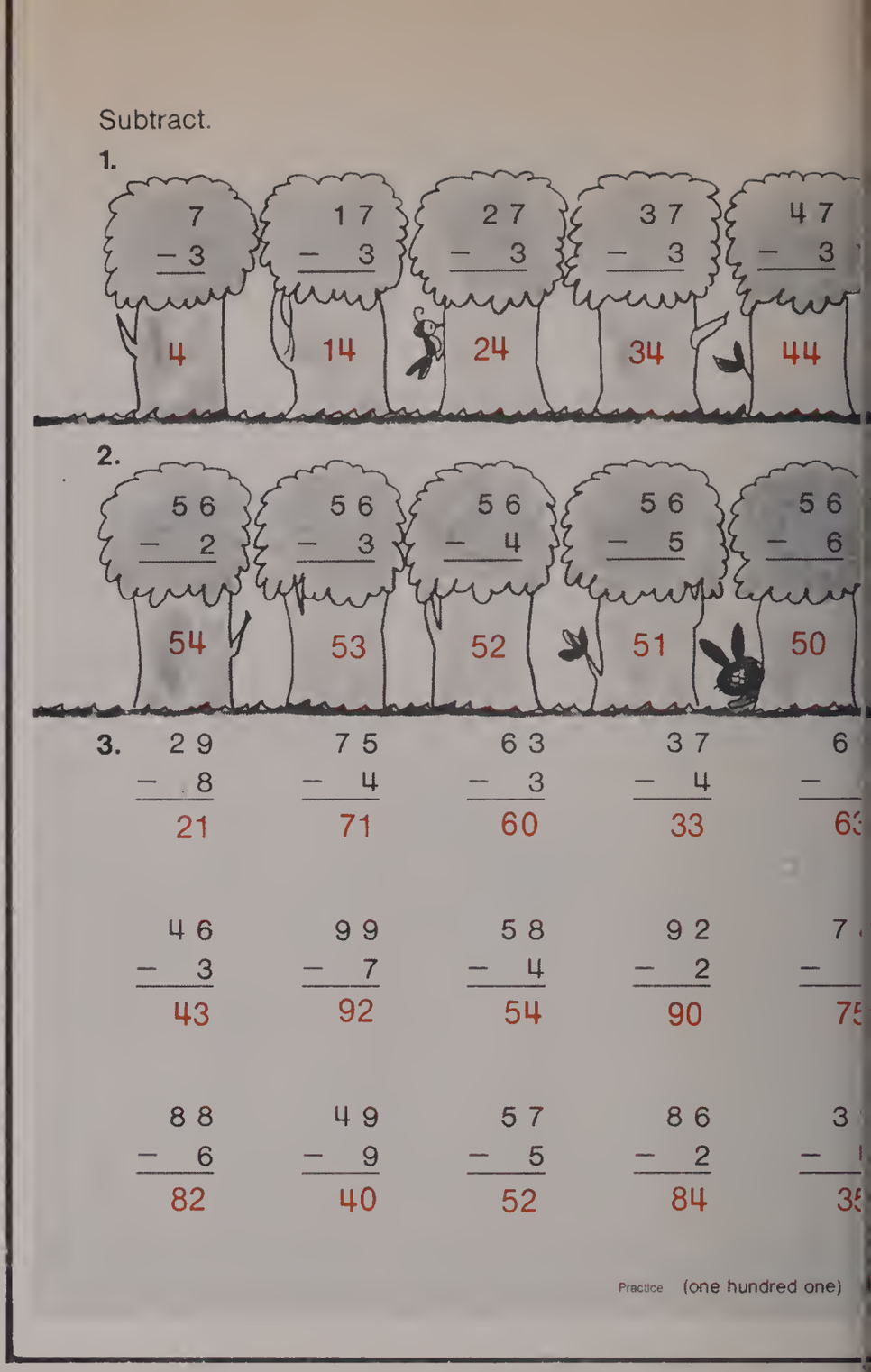
3. Two children may play this game. Shuffle three packs of numeral cards for 1 through 9. Place the cards in a stack face down. The children take turns turning over a card face up on the table. The first child who sees the sum 9 on two or more cards (e.g., 2, 3, and 4) says "Nine" and collects those cards that show sum 9. They continue taking turns in turning over the cards one at a time. The child who has more cards, when all cards have been turned over, wins the game.

4. Involve the child in the caterpillar number puzzle with additions and subtractions, sums 9 or less. (See Item 3, Number Puzzles, in the Activity Reservoir.)

5. Challenge the child with these subtractions. The two on the right involve regrouping. The child uses the pattern to find the last two differences.

$$\begin{array}{r} 34 \\ -\ 2 \\ \hline \end{array} \quad \begin{array}{r} 34 \\ -\ 3 \\ \hline \end{array} \quad \begin{array}{r} 34 \\ -\ 4 \\ \hline \end{array} \quad \begin{array}{r} 34 \\ -\ 5 \\ \hline \end{array} \quad \begin{array}{r} 34 \\ -\ 6 \\ \hline \end{array}$$

You may provide the child with blocks to check the answers.



Using the Book Panel 1: Assist the child in completing the first two exercise Then tell the child to subtract. Ask, "How do the numbers from which you subtract differ? (Each is 10 more than the preceding number.) How are the answers different? (Each is 10 more than the preceding answer.)"

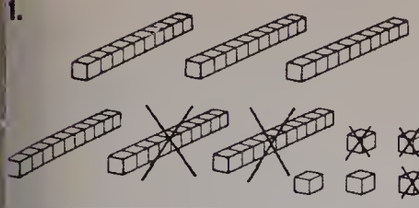
Panel 2: Assist the child in completing the first two exercises. Then tell the child to subtract. Ask, "How are these problems different? (Each has the same number from which we subtract; each time we subtract one more.) How are the answers different? (Each is one less than the preceding answer.)"

Panel 3: Tell the child to subtract.

RELATED AIDS

BFA COMP LAB I—50, 51.
BFA PROB. SOLVING I—68, 69.

Subtracting Tens and Ones

1. 

Subtract.

tens	ones
6	5
− 2	3
4	2

$$\begin{array}{r} 65 \\ -\ 23 \\ \hline 42 \end{array}$$

Subtract.

75	99	48	86	99	67
− 62	− 12	− 18	− 32	− 50	− 31
13	87	30	54	49	36
49	97	68	57	65	88
− 26	− 60	− 24	− 45	− 45	− 43
23	37	44	12	20	45
87	68	86	95	69	88
− 14	− 17	− 50	− 81	− 59	− 71
73	51	36	14	10	17
86	79	77	46	59	95
− 64	− 53	− 46	− 36	− 11	− 40
22	26	31	10	48	55
78	76	59	86	98	27
− 12	− 30	− 38	− 21	− 36	− 13
66	46	21	65	62	14
99	74	38	95	57	39
− 27	− 23	− 15	− 73	− 20	− 24
72	51	23	22	37	15

Using the Book Panel 1: Have the child give the numeral for the number of tex-boxes and blocks in all, and find and trace the numeral in the place value chart. Emphasize the purpose of the tens and ones boxes. Call attention to the marks on the blocks. Have the child give the numeral for the number of marked blocks, and find and trace the numeral in the place value chart. Emphasize the purpose of the tens and ones boxes. Call attention to the long form. Explain, we are subtracting 2 tens + 3 ones from 6 tens + 5 ones, we subtract ones from ones and tens from tens. The child may read and trace the numeral for the difference and compare the difference with the unmarked blocks. Call attention to the short form. You may have the child verify the answer by asking, "Five ones minus 3 ones is equal to how many ones? (2) Six tens minus 2 tens is equal to how many tens? (4)"

Panels 2-7: Tell the child to subtract.

OBJECTIVE

To subtract tens and ones, no regrouping.

PACING

Level A	All (1 guided)
Level B	All (1 guided)
Level C	All (1 guided)

MATERIALS

7 ten-boxes, 9 blocks

SUGGESTIONS

Initial Activity Show a set of blocks with 7 ten-boxes and 9 blocks. Ask the child to take away 3 ten-boxes and 4 blocks. Tell how many ten-boxes and blocks are left. Write:

Subtract

Tens	Ones
7	9
− 3	4

$$\begin{array}{r} 79 \\ -\ 34 \end{array}$$

Relate each subtraction to the activity. Stress that we should subtract ones first.

ACTIVITIES

1. Adapt the game Concentration in the Activity Reservoir. Use 8 cards. A match would be 7 - 2 and 5.

2. Involve the child in a game of Basketball. See the Baseball game in the Activity Reservoir. Give 1 point for exercises with adding and subtracting ones from ten and ones. Give 2 points for exercises with two-digit additions and subtractions.

3. Challenge the child with:

64	64	64	64	64	64
-21	-22	-23	-24	-25	-26

Tell the child to use the pattern to find the differences.

RELATED AIDS

BFA COMP LAB I—50, 51.
BFA PROB. SOLVING I—68, 69.

OBJECTIVE

To practice subtracting tens and ones, no regrouping.

PACING

Level A All
Level B All
Level C All

SUGGESTIONS

Initial Activity Use the place value chart described on page 94. Put 7 strips in the tens pocket and 9 strips in the ones pocket. Ask the child to take away 3 tens-strips and 4 ones-strips. The child tells how many tens-strips and ones-strips remain. Write:

Tens	Ones
7	9
3	4
4	5

79
−34

Relate each subtraction to the activity.

ACTIVITIES

1. Play Flash Card Sports as described in the Activity Reservoir. Use two digit subtractions.

2. Adapt the card activity above. Give two children identical sets of cards to pair correctly for speed.

3. The child may wish to verify some of the exercises on this page using a mini-calculator.

EXTRA PRACTICE

Practice Exercises p. 252 (bottom)

Tell the child to subtract.

1.	58	35	62	79	46
	−12	−24	−32	−21	−10
	46	11	30	58	36
2.	24	88	73	97	39
	−13	−11	−52	−62	−15
	11	77	21	35	24
3.	66	42	85	75	53
	−26	−10	−25	−24	−41
	40	32	60	51	12
4.	87	92	36	71	69
	−23	−50	−22	−21	−38
	64	42	14	50	31

Subtract.

1.	35	99	76	47	95	3
	−12	−54	−26	−13	−41	−2
	23	45	50	34	54	1
2.	68	79	86	47	29	8
	−46	−17	−30	−24	−15	−2
	22	62	56	23	14	6
3.	67	84	39	88	76	9
	−50	−44	−12	−17	−65	−3
	17	40	27	71	11	67
4.	49	57			98	5
	−33	−15			−20	−2
	16	42			78	3
5.	86	38	24	66	79	5
	−51	−22	−10	−24	−59	−4
	35	16	14	42	20	1
6.	87	68	65	98	55	9
	−66	−35	−53	−63	−35	−1
	21	33	12	35	20	8
7.	59	66	94	69	87	7
	−31	−43	−81	−38	−71	−4
	28	23	13	31	16	3
8.	56	63	69	67	95	7
	−42	−13	−20	−17	−74	−3
	14	50	49	50	21	4

Practice. subtracting tens and ones, no regrouping (one hundred three) 10

Using the Book Panels 1–8: Tell the child to subtract.

RELATED AIDS

BFA COMP LAB I—50, 51.
BFA PROB. SOLVING I—68, 69.

Main Street

windows

garbage cans

garbage can lids

parking meters

1. 26 women. 23 men. How many in all?	26 + 23 49
2. 59 windows. 27 shades. How many more windows need shades?	59 − 27 32
3. 68 garbage cans. 6 garbage can lids. How many more lids are needed?	68 − 6 62
4. 45 old parking meters. 24 new parking meters. How many in all?	45 + 24 69

Using the Book Discuss the scene at the top of the page showing the Neighborhood and Community Helpers. You may have the child identify the police officer, the fire fighter, the mail carrier, the grocer, and the shopper. Then call attention to the picture dictionary.

Panel 1: Have the child read the problem. Ask, "Do we add or subtract? (Add)" Record the information on the chalkboard as you ask, "How many women? (26) How many men? (23)" Have the child write the + sign and complete the addition. Ask, "How many in all? (49)"

Panels 2-4: Assist the child in reading the mini-problems. Then tell the child, "For each problem, you must decide whether to add or subtract. Then show your work on the purple column on the right. Write + or − before the second numeral in each addition or subtraction."

OBJECTIVES

To solve mini-problems
To add and subtract with two-digit numerals, no regrouping

PACING

Level A	All (1, 2 guided)
Level B	All (1 guided)
Level C	All (1 guided)

MATERIALS

mini-problems, similar to those on page 104 on index cards

SUGGESTIONS

Initial Activities 1. On the chalkboard write:

25	47	62
+30	+51	+ 5

Have the child find the sums.

2. Then write:

47	58	79
-30	-26	- 4

Have the child find the differences.

3. Write mini-problems similar to those on page 104 on index cards or on transparencies. Assist the child in reading and solving several of them. You might want to use some of the same numbers in 1 and 2 above. If you do not complete all of the mini-problems, place them on the worktable so that a child may work on them in spare time.

4. Point out a "counting on" strategy by using tally marks for children who might need a manipulative device. For example, in adding 31 + 8, say, "Make 8 tally marks. Begin with 31 and count the marks as 32, 33, 34, . . . 39." Verify the answer.

Point out the consumer aspect of this page. Discuss civil service workers—community services or helpers who are paid by tax dollars (fire fighters, mail carriers, police officers, and sanitation workers).

RELATED AIDS

ACT. MASTERS—Seasonal 5.
BFA PROB. SOLVING I—64, 65, 70-72.

OBJECTIVE

To add sums 10 and less

PACING

Level A	All (1-2 guided)
Level B	All (1-2 guided)
Level C	All (1-2 guided)

MATERIALS

10 blocks

SUGGESTIONS

Initial Activities 1. Show a set of 8 blocks and a set of 2 blocks. Have the child give the number of each set and the number of blocks in all. Write:

$$\begin{array}{r} 8 \\ +2 \\ \hline \end{array}$$

and have the child give the sum. Write:

$$\begin{array}{r} 2 \\ +8 \\ \hline \end{array}$$

and have the child give the sum.

2. You may adapt the procedures in Item 1 to develop the other facts from sum 10.

ACTIVITIES

1. Adapt the Basic Fact Wheel in the Activity Reservoir for adding, sums 10 and less.

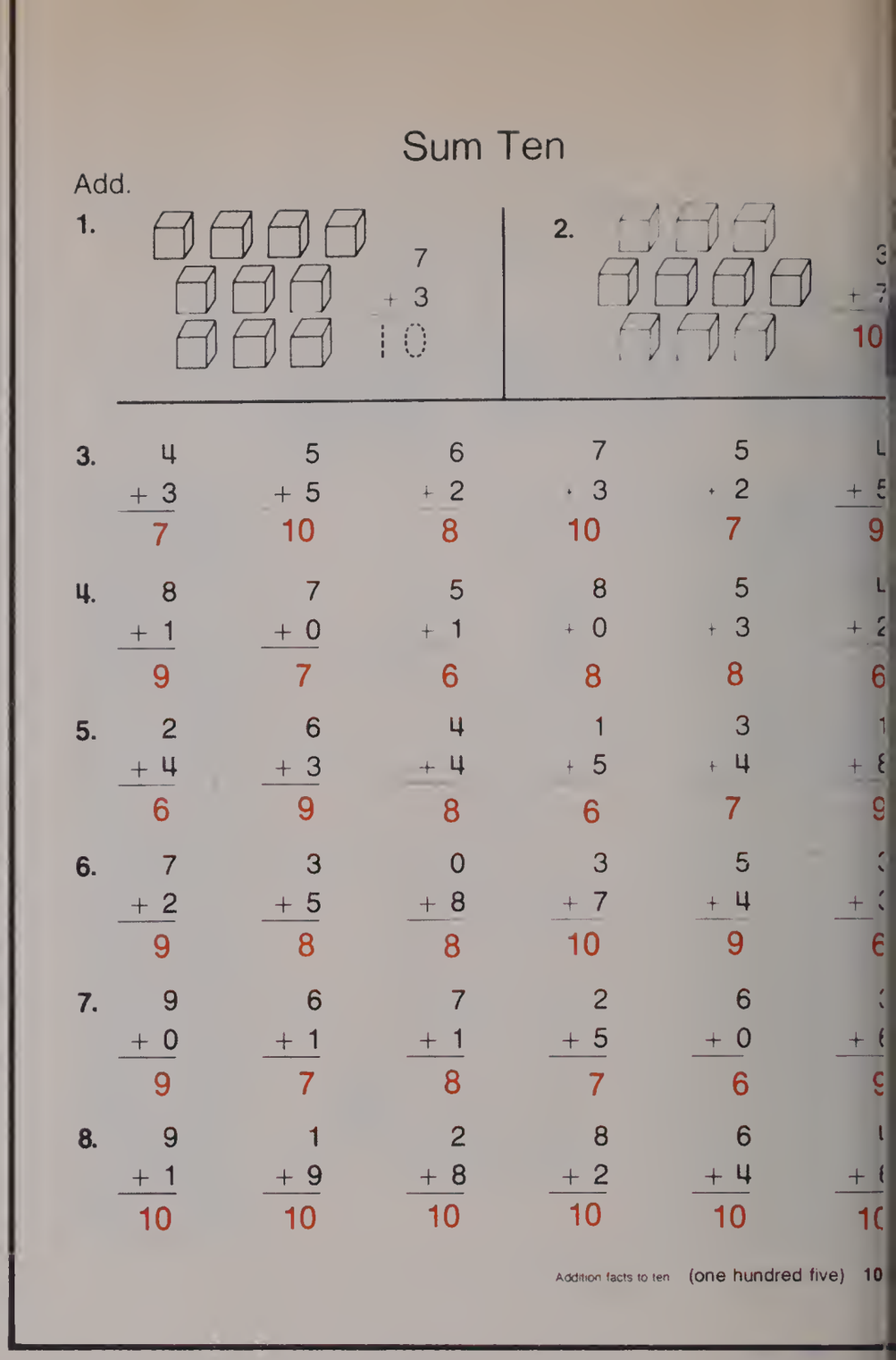
2. Give the child oral practice for addition, sums through 10. Have the child respond as quickly as possible.

EXTRA PRACTICE

Practice Exercises p. 253 (top left)

RELATED AIDS

ACT. MASTERS—18.
—Seasonal 1, 2.
—Gen. Use 7-9, 13.
BFA COMP LAB I—8, 9.



Sum Ten

Add.

1. 7 + 3 = 10

2. 3 + 7 = 10

3.	4 + 3 = 7	5 + 5 = 10	6 + 2 = 8	7 + 3 = 10	5 + 2 = 7	4 + 5 = 9
4.	8 + 1 = 9	7 + 0 = 7	5 + 1 = 6	8 + 0 = 8	5 + 3 = 8	4 + 2 = 6
5.	2 + 4 = 6	6 + 3 = 9	4 + 4 = 8	1 + 5 = 6	3 + 4 = 7	1 + 8 = 9
6.	7 + 2 = 9	3 + 5 = 8	0 + 8 = 8	3 + 7 = 10	5 + 4 = 9	3 + 3 = 6
7.	9 + 0 = 9	6 + 1 = 7	7 + 1 = 8	2 + 5 = 7	6 + 0 = 6	3 + 6 = 9
8.	9 + 1 = 10	1 + 9 = 10	2 + 8 = 10	8 + 2 = 10	6 + 4 = 10	4 + 6 = 10

Using the Book Panel 1: Ask, "How many red blocks? (7) How many green blocks? (3) How many blocks in all? (10) Seven plus 3 is equal to what number? (10)" Have the child trace the sum.

Panel 2: Use a procedure similar to panel 1. Ask, "Is the sum the same? (yes) Does the order of the addends change the sum? (no)"

Panels 3-8: Tell the child to add.

Scottish Fair

1. 5 girls dancing.
5 boys dancing.
How many children were dancing?

$$\begin{array}{r} 5 \\ +\ 5 \\ \hline 10 \end{array}$$

2. 56 bagpipes.
23 drums.
How many bagpipes and drums were there in all?

$$\begin{array}{r} 56 \\ +\ 23 \\ \hline 79 \end{array}$$

3. 67 red kilts.
45 green kilts.
How many more red kilts?

$$\begin{array}{r} 67 \\ -\ 45 \\ \hline 22 \end{array}$$

4. The parade had 56 pipers and 23 drummers. How many more pipers were there?

$$\begin{array}{r} 56 \\ -\ 23 \\ \hline 33 \end{array}$$

sing the Book This is the first page on which the child encounters fully ated word problems. The importance of this page is to give the child practice reading a word problem, then interpreting the problem, and finally in setting the computation. You may have the child complete each computation.

For each problem, assist the child in reading the problem. It may be cessary to read a problem more than once. Ask the child to describe the oblem in his or her own words. The child may cross out all unnecessary words a problem or ring those words and numbers that are needed in order to solve e problem. Have the child decide whether to add or subtract and then write e addition or subtraction that goes with the problem such as:

$$\begin{array}{r} 56 \\ +23 \\ \hline \end{array}$$

OBJECTIVE

To learn how to solve word problems

PACING

Level A	All (guided)
Level B	All (1-3 guided)
Level C	All (1-2 guided)

MATERIALS

index cards, with short simple word problems similar to those on page 106

BACKGROUND

This is the first lesson in which the child encounters word problems with complete sentences. The objective of this lesson is not to solve the problem, but to practice reading a problem and setting up the computation. You may or may not have the child complete the computation.

SUGGESTIONS

Initial Activity The child may practice reading word problems and setting up the computations by using the word-problem cards suggested above in Materials.

ACTIVITIES

1. The child may use the Domino Cards described in the Activity Reservoir to practice basic facts through sum 10.

2. Have the child work Item 2, Number Puzzles for sums 10 and less described in the Activity Reservoir.

3. Challenge the child to create word problems similar to those on page 106. Then place these problems on the worktable for other children to read and solve.

RELATED AIDS

ACT. MASTERS—Seasonal 5, 7.
BFA PROB. SOLVING I—64, 65, 70-72.

OBJECTIVE

To subtract from 10 and less

PACING

Level A	All (1-2 guided)
Level B	All (1-2 guided)
Level C	All (1 guided)

MATERIALS

10 blocks

SUGGESTIONS

Initial Activities 1. Show a set of 10 blocks. Have the child count them. Take away 3 blocks and have the child give the number taken away. Write:

$$\begin{array}{r} 10 \\ -\ 3 \\ \hline \end{array}$$

Have the child count the remaining blocks and give the difference. Write:

$$\begin{array}{r} 10 \\ -\ 7 \\ \hline \end{array}$$

and have the child give the difference.

2. You may adapt the procedures in item 1 to develop the other subtraction facts from 10.

ACTIVITIES

1. Adapt the Basic Fact Wheel in the Activity Reservoir for subtracting, 10 and less.

2. Give the child oral drill on subtracting from 10 and less.

3. Involve the child in Bulletin Board suggestion 2 in the Chapter Overview.

EXTRA PRACTICE

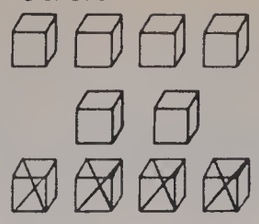
Practice Exercises p. 253 (top right)

RELATED AIDS

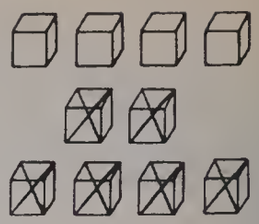
ACT. MASTERS—18, 20.
—Seasonal 3, 4.
—Gen. Use 10, 11, 13.
BFA COMP LAB I—46, 47.
BFA PROB. SOLVING I—62.

Subtracting from Ten

Subtract.

1. 

$$\begin{array}{r} 10 \\ -\ 4 \\ \hline 6 \end{array}$$

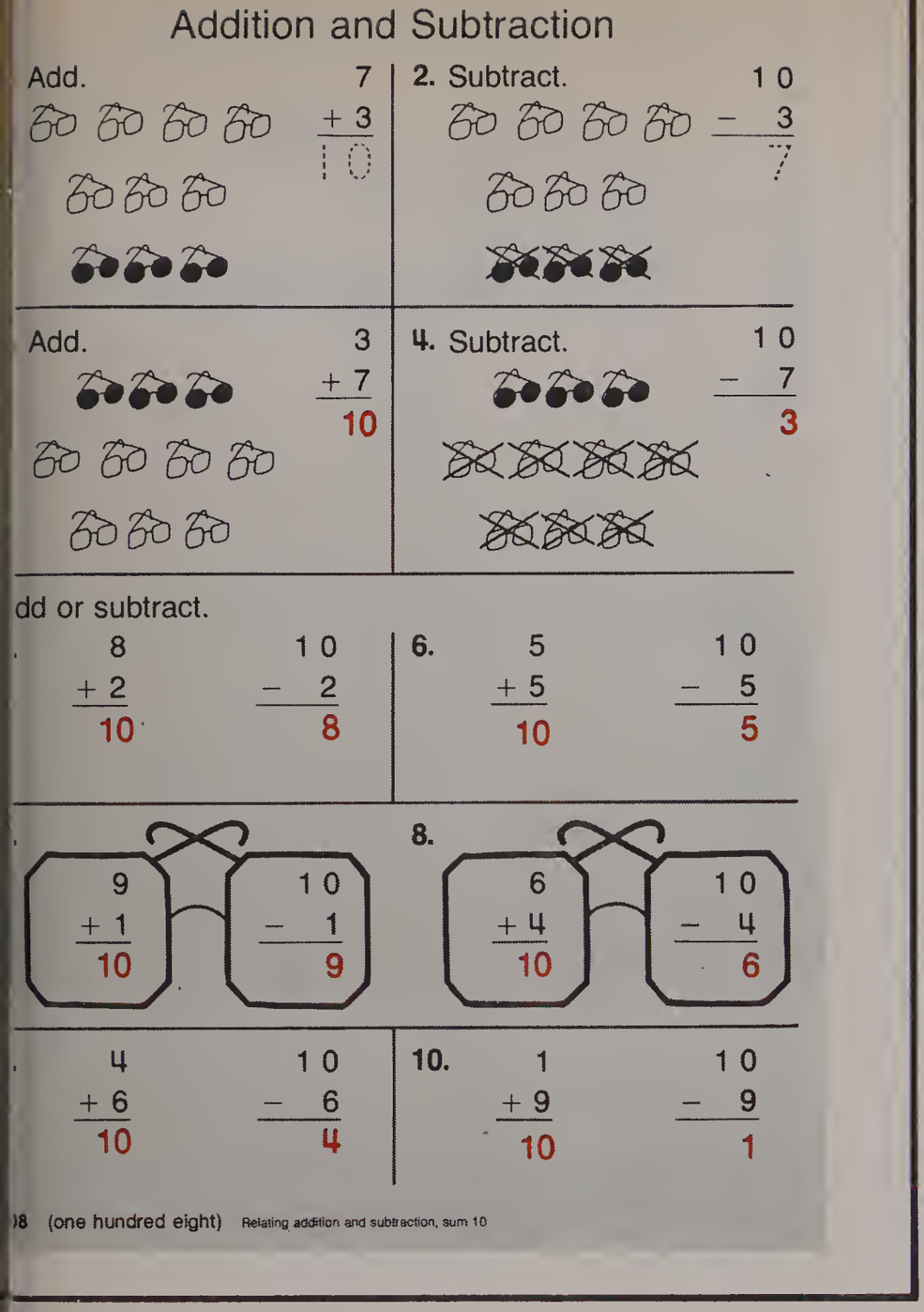
2. 

3.	$\begin{array}{r} 10 \\ -\ 8 \\ \hline 2 \end{array}$	$\begin{array}{r} 9 \\ -\ 6 \\ \hline 3 \end{array}$	$\begin{array}{r} 8 \\ -\ 2 \\ \hline 6 \end{array}$	$\begin{array}{r} 10 \\ -\ 2 \\ \hline 8 \end{array}$	$\begin{array}{r} 9 \\ -\ 3 \\ \hline 6 \end{array}$
4.	$\begin{array}{r} 9 \\ -\ 0 \\ \hline 9 \end{array}$	$\begin{array}{r} 8 \\ -\ 4 \\ \hline 4 \end{array}$	$\begin{array}{r} 8 \\ -\ 7 \\ \hline 1 \end{array}$	$\begin{array}{r} 7 \\ -\ 7 \\ \hline 0 \end{array}$	$\begin{array}{r} 8 \\ -\ 3 \\ \hline 5 \end{array}$
5.	$\begin{array}{r} 9 \\ -\ 4 \\ \hline 5 \end{array}$	$\begin{array}{r} 8 \\ -\ 1 \\ \hline 7 \end{array}$	$\begin{array}{r} 9 \\ -\ 7 \\ \hline 2 \end{array}$	$\begin{array}{r} 10 \\ -\ 3 \\ \hline 7 \end{array}$	$\begin{array}{r} 7 \\ -\ 6 \\ \hline 1 \end{array}$
6.	$\begin{array}{r} 9 \\ -\ 2 \\ \hline 7 \end{array}$	$\begin{array}{r} 8 \\ -\ 6 \\ \hline 2 \end{array}$	$\begin{array}{r} 9 \\ -\ 1 \\ \hline 8 \end{array}$	$\begin{array}{r} 10 \\ -\ 7 \\ \hline 3 \end{array}$	$\begin{array}{r} 8 \\ -\ 5 \\ \hline 3 \end{array}$
7.	$\begin{array}{r} 7 \\ -\ 5 \\ \hline 2 \end{array}$	$\begin{array}{r} 10 \\ -\ 6 \\ \hline 4 \end{array}$	$\begin{array}{r} 9 \\ -\ 8 \\ \hline 1 \end{array}$	$\begin{array}{r} 7 \\ -\ 4 \\ \hline 3 \end{array}$	$\begin{array}{r} 8 \\ -\ 0 \\ \hline 8 \end{array}$
8.	$\begin{array}{r} 8 \\ -\ 8 \\ \hline 0 \end{array}$	$\begin{array}{r} 10 \\ -\ 5 \\ \hline 5 \end{array}$	$\begin{array}{r} 10 \\ -\ 4 \\ \hline 6 \end{array}$	$\begin{array}{r} 7 \\ -\ 1 \\ \hline 6 \end{array}$	$\begin{array}{r} 6 \\ -\ 4 \\ \hline 2 \end{array}$

Using the Book Panel 1: Ask, "How many blocks? (10) How many are taken away? (4) How many are left? (6) Ten minus 4 is equal to what number? (6)" Have the child trace the difference.

Panel 2: Adapt the same procedure used in Panel 1.

Panels 3-8: Tell the child to subtract.



Using the Book Panels 1-2: Relate the addition to the pictures. "There are red eyeglasses and 3 blue sunglasses. How many glasses are there in all? 10) Seven plus 3 is what number?" Have the child trace the 10.

For the subtraction, say, "There were 10 glasses in all. Three glasses were taken away. (The X's show glasses taken away.) How many glasses are left? (7) Ten minus 3 is what number?" Have the child trace 7. Explain that panels 1 and 2 show related addition and subtraction exercises. Panel 1 shows adding 3 to 7 to get the sum 10. Panel 2 shows subtracting 3 from the sum 10 to get 7.

Panels 3-4: Notice that the order of the addends is changed to show adding 7 and subtracting 7. Relate a similar story and have the child complete each panel.

Panels 5-10: Tell the child to add and subtract.

OBJECTIVE

To relate addition and subtraction sum 10, vertical form

PACING

Level A	All (1-3 guided)
Level B	All (1-2 guided)
Level C	All (1-2 guided)

MATERIALS

flannel board, 8 red disks, 2 blue disks

SUGGESTIONS

Initial Activities On the flannel board show 8 red disks in a row. Ask the child to put 2 blue disks in a row below the red disks. Write and develop:

Do		Undo:	
	8		10
	+ 2		− 2
	10		8

Ask, "How many disks in all? (10)" Then you remove the 2 blue disks. Ask, "How many disks are left? (8) Did I undo what you had done? (yes)" "Did we add 2 to 8? (yes) What was the sum? (10) Then did we subtract 2 from 10? (yes) What was the difference? (8)" Explain that the addition and subtraction show related additions and subtractions.

ACTIVITIES

1. Place vertical addition practice cards for sum 10 in random order. Ask the child to write a related subtraction in vertical form for each addition.

2. Involve the child in Bulletin Board suggestion 2 in the Chapter Overview.

3. Give the child oral drill on adding and subtracting, sums 10 and less. For example, say, "6 plus 4 (pause), subtract 5 (pause), add 2 (pause), subtract 4 (pause), add 7 (pause). What is the answer? (10)"

4. Involve the child in Item 1 of the Number Puzzles described in the Activity Reservoir. The sum along any line should be 10.

RELATED AIDS

ACT. MASTERS—18, 20.
—Seasonal 1-4.
—Gen. Use 7-11, 13.
BFA COMP LAB I—8, 9, 46, 47.
BFA PROB. SOLVING I—62.

OBJECTIVE

To complete an addition table showing sums 10 and less

PACING

Level A All (guided)
Level B All (guided)
Level C All

MATERIALS

addition practice cards (through sum 10)

SUGGESTIONS

Initial Activities Draw part of an addition table on the chalkboard. You might color the top row and the left column as on page 109. Make each frame large enough to hold an addition practice card. Show cards like 1 + 3. Have the child name the first addend and then the second addend. Relate these to the left column and top row, respectively. Where the row with 1 and column with 3 meet, tape the card for 1 + 3. Have the child give the sum. Remove the card for 1 + 3 and write 4 in the frame. Do the same for 3 + 6 and 5 + 0 and 8 + 2.

ACTIVITIES

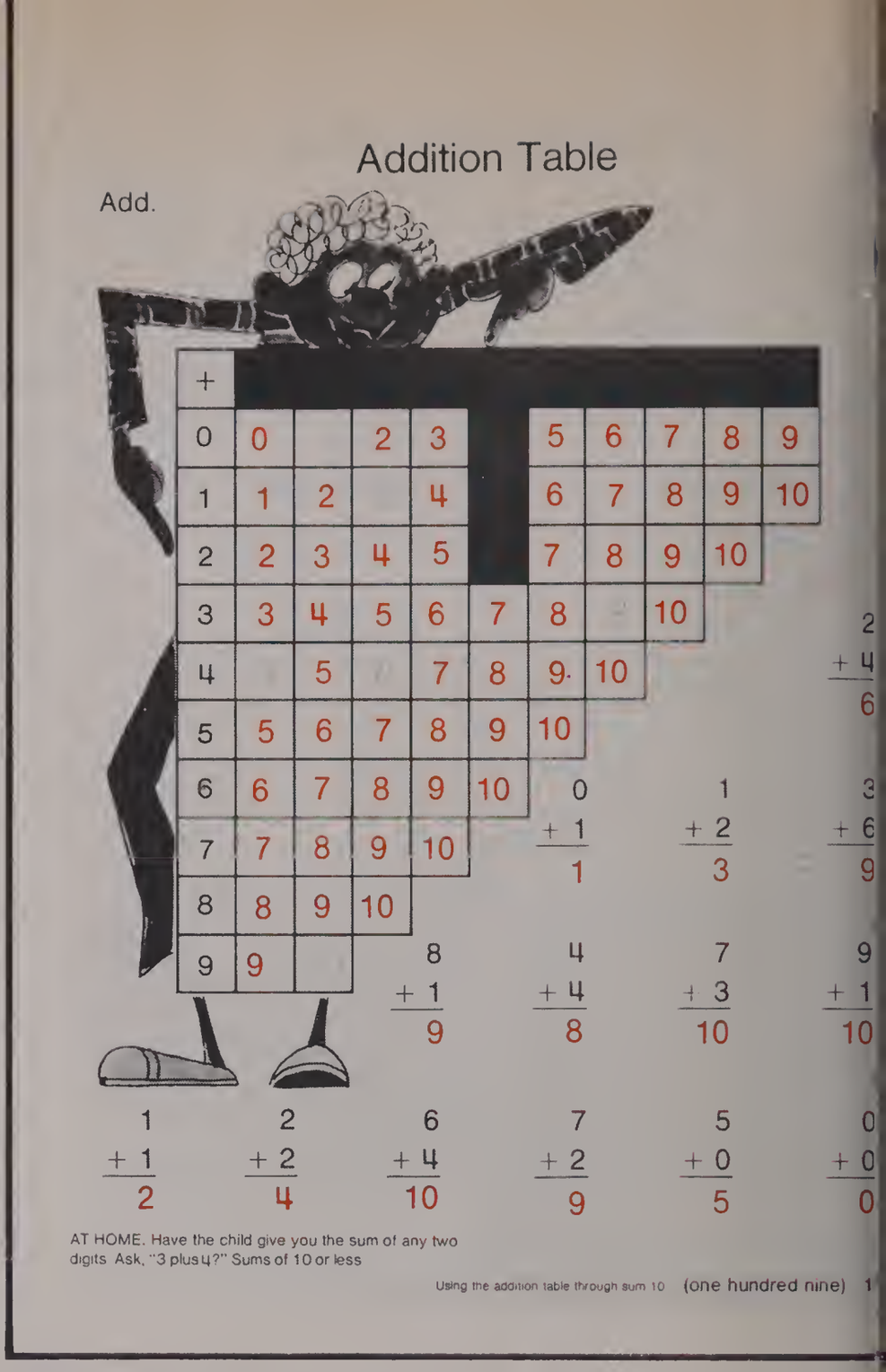
1. Involve the child in the Ladder Game. (See Activity Reservoir.) Each step of the ladder should have an addition or subtraction fact for sums 7, 8, 9, or 10.

2. Involve the child in the Concentration Game in the Activity Reservoir. Use addition and subtraction facts, sums 7, 8, 9, and 10.

3. Involve the child in an oral drill on adding and subtracting, sums 10 or less.

RELATED AIDS

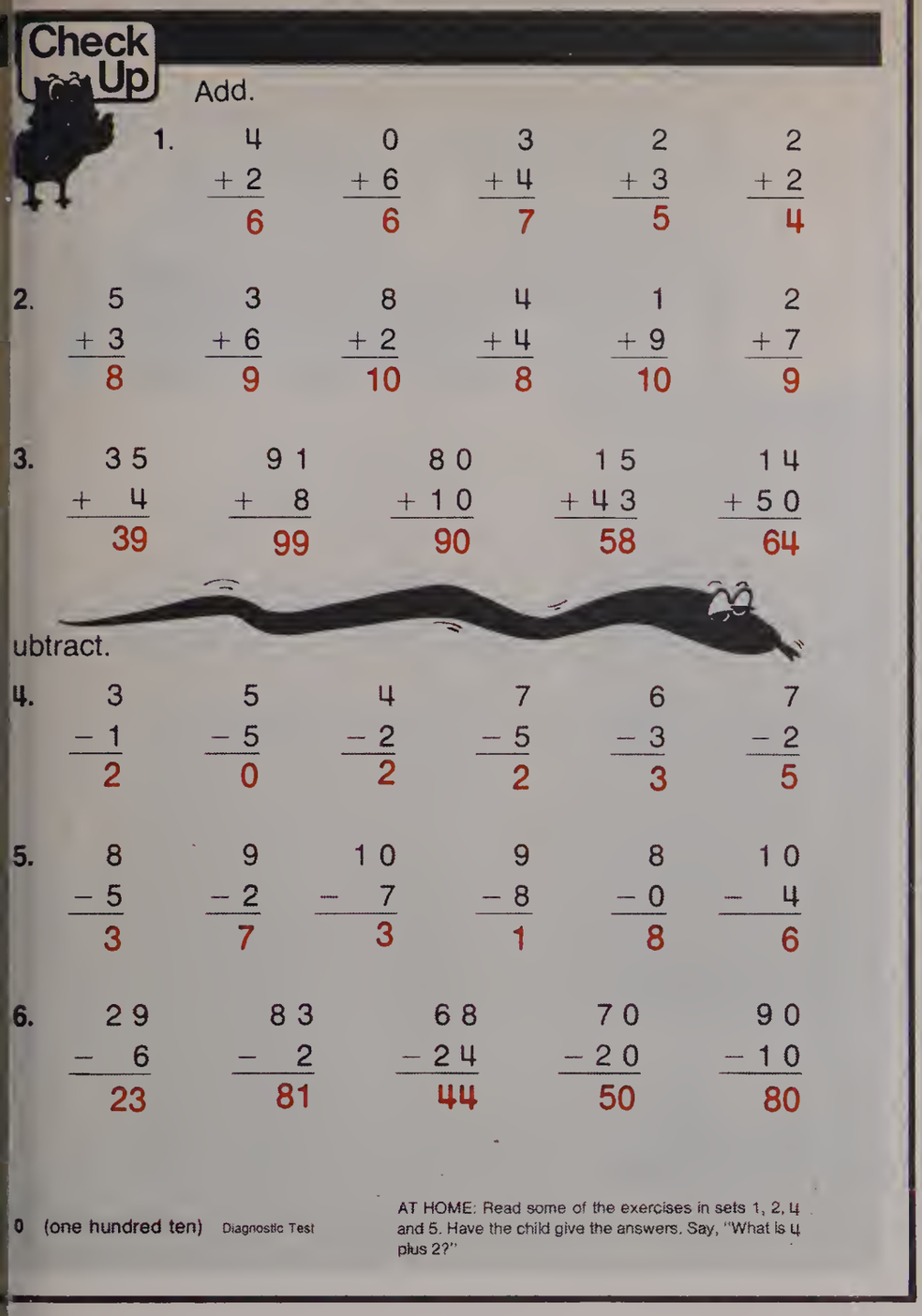
ACT. MASTERS—18.
—Seasonal 1, 2.
—Gen. Use 7-9, 13.
BFA COMP LAB I—8, 9.



Using the Book Write 2 + 4 on the chalkboard. Ask, "What is the first addend? (2) What is the second addend? (4) What is the sum? (6)" Tell the child, "We will see how the addition table is made to show the sum 2 + 4 = 6." Ask the child to touch 2 in the yellow column and also 4 in the top (blue) row. Have the child follow the yellow path until it meets the blue path. Have the child trace over the 6. Explain, first addends are given in the yellow column and second addends are given in the blue row. Then the sums are given in the squares where the rows and columns meet. Direct the child in giving each of the following sums in the table: 0 + 1, 1 + 2, 3 + 6, and 4 + 0. Have the child complete the table.

Then have the child add in the addition exercises.

At Home Upon completion of page 110, the child may take this page home and do the At Home activities suggested on pages 109 and 110.



Using the Book This is a mastery diagnostic page. (See Suggestions.) Encourage the child to write each sum and difference without counting.

Panels 1-3: Tell the child to add.

Panels 4-6: Tell the child to subtract.

At Home Upon completion of the pupil page, the child may take the page home and do the At Home activity suggested at the bottom of the page.

OBJECTIVE

To diagnose skill in adding and subtracting through sum 10 and two-digit numbers, no regrouping

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

This page can be used to diagnose difficulties the child might have with adding and subtracting sums through 10 and two-digit numbers, no regrouping. The entire page need not be assigned in a single day. If preferred, you may test addition on one day and subtraction on another. On the basis of performance, you may want to provide individual help or additional remedial work for those children who have difficulty with a particular skill. The chart shows the page numbers to which the items and concepts apply.

Panel	Skill	Page
1	Sums 1-7	25
2	Sums 8-10	69, 71, 105
3	Adding, no regrouping	93, 95 97
4	Subtracting from 7 or less	31, 37
5	Subtracting from 8-10	75, 76, 107
6	Subtracting, no regrouping	100, 102

ACTIVITIES

1. Use the "kennel" constructed in the activity for page 111. Give the child the addition practice cards for sums 6 through 10 and differences 3 through 9. Tell the child to place each card in the cell that shows the sum or difference.

2. For oral practice, sums 10 and less, use the game Stop the Magician described in the Activity Reservoir.

RELATED AIDS

ACT. MASTERS—18, 20.
—Seasonal 1-4.
—Gen. Use 7-11, 13.
BFA COMP LAB I—8, 9, 46, 47.
BFA PROB. SOLVING I—62.

OBJECTIVE

To solve word problems

PACING

Level A All (1-4 guided)
Level B All (1-2 guided)
Level C All (1 guided)

MATERIALS

index cards with word problems similar to those on page 111.

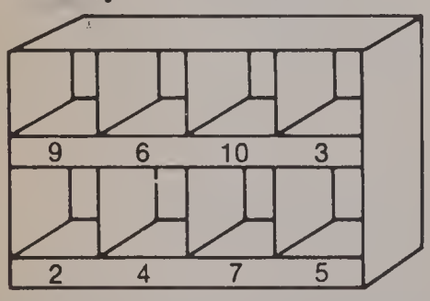
SUGGESTIONS

Initial Activities Select some cards with word problems. Have the child practice reading the word problems, telling whether to add or subtract, and answering the question.

The career for this page is Veterinarians. Discuss animal doctors with the child. Maybe the child can tell what an animal doctor does and relate an experience of taking a pet to an animal clinic. Ask, "How do animal doctors work with people? (They are doctors for people's pets.)" See Career Awareness in the Chapter Overview for more information.

ACTIVITIES

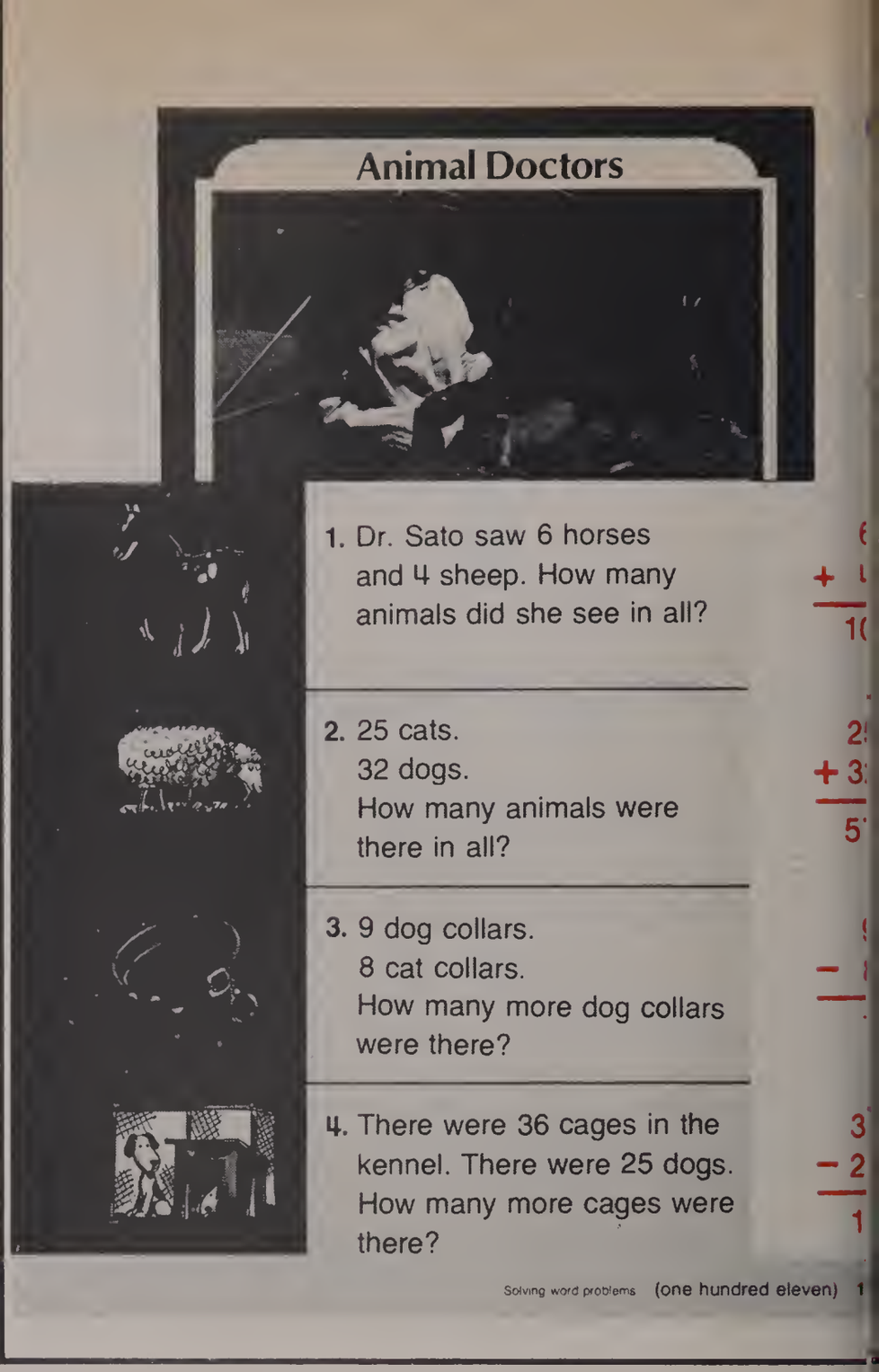
Involve the class in this activity. Make shelves out of shoe boxes. Each shelf should have a number less than 11 on it. The box may look like a kennel.



Have children cut out pictures of various animals and group them into sets of 5 or less members. Then paste them on cards or paper. Have the child sort the cards so that the number on each box is an answer.

RELATED AIDS

ACT. MASTERS—21.
—Seasonal 5.
BFA PROB. SOLVING I—64, 65, 70-72.



Using the Book Discuss the picture at the top of the page. (See Career Awareness in the Chapter Overview.)

Assist the child in reading each word problem. The child may need to read a problem more than once. Give an interpretation of the problem. Then have the child solve the problem, showing the computation in the column at the right.

The child learns to decide whether to add or to subtract according to the context of the problem. The clue words "left" and "how many more" sugges subtraction. The clue words "in all" suggest addition.

Some children might need help. Assist them in identifying the key words and ringing them.

THINK!

1. Add.

6	4	5
+ 4	+ 6	+ 5
10	10	10

2. Subtract.

10	10	10
− 6	− 4	− 5
4	6	5

3. Complete.

	tens	ones
37 =	3	7
14 =	1	4
41 =	4	1

4. Complete.

tens	ones	
3	4	= 34
4	3	= 43
1	9	= 19

dd or subtract.

5.

42	40	50	15	48
+ 5	+ 10	+ 7	+ 51	+ 1
47	50	57	66	49

6.

64	50	76	83	48
− 4	− 30	− 3	− 42	− 25
60	20	73	41	23

7. 35 moths. 23 ladybugs.
How many bugs in all?

35
+ 23
58

Using the Book This is a diagnostic test. The page references are given for re-teaching as needed. The letter indicates the objective.

Panels 1-2: Tell the child to add or subtract. [105, 107 D]

Panels 3-4: Tell the child to complete the place value chart for each number. [page 94 A]

Panel 5: Tell the child to add. [pages 93, 95, 97 B]

Panel 6: Tell the child to subtract. [pages 99, 100, 102 C]

Panel 7: Tell the child to decide whether to add or subtract and find the answer. [pages 104, 106, 111 E]

OBJECTIVE

To evaluate achievement of the Chapter Objectives

PACING

Level A All
Level B All
Level C All

SUGGESTIONS

The Chapter Test is designed to be used in a diagnostic manner. It assesses the child's knowledge of the main concepts and skills that were taught in this chapter. Some children should take this test independently with guidance for instructions only. Use judgment as to whether certain children should be guided through some or all of the exercises. Check each child's work and mark the items that are incorrect. Reteaching or extra practice might be necessary to help the child acquire the concept or skill that was missed. With this reteaching, you will be able to ascertain whether the child has then learned the topic in question. See Using the Book for page references indicating where the concept or skill was taught.

ACTIVITIES

Involve the class in a game of Baseball. See the Activity Reservoir. For this game you may have

singles— addition facts, sums 10 and less.

doubles— subtracting from 7, 8, 9, and 10.

triples— adding three one-digit numbers, sums less than 11.

home runs—adding and subtracting four or more numbers such as 2 plus 3 minus 2 plus 5, etc.

The addition for *home run* has not yet been treated formally so prepare them for this (see chapter 7), by treating it as addition of 2 numbers at a time.

CHAPTER 7 OVERVIEW

The numbers 100 through 999 are introduced. Recognition of pennies, nickels, dimes, quarters and dollars is included along with exercises and problems related to money.

OBJECTIVES

A To write and read three-digit numerals
B To identify which one of two numbers, each less than 1000, is greater or less
C To count through 999
D To count by fives through 995
E To count by tens through 990
F To identify pennies, nickels, dimes, quarters, and dollars, and tell how many cents each is worth
G To find the sum of 3 addends

VOCABULARY

hundred 113
hundreds 113
hundred-box 113
three-digit numeral 114
penny 125
nickel 125
dime 125
cents 125
coin 125
quarter 129
quarters 129
dollar 131

BACKGROUND

There are essentially two ways to compare numbers between 100 and 1000. We may compare the hundreds, tens, and ones. The numeral that shows more hundreds names the greater number. If the hundreds are the same, we compare the tens. If the hundreds and tens are the same, we compare the ones. We may also compare numbers by comparing their positions in the counting sequence. In this chapter, the child may compare hundreds or consider the counting sequence.

MATERIALS

10 full ten-boxes
10 hundred-boxes
pocket chart and numeral and word cards for it
index cards with problems
numeral cards for 0 through 9
numeral chart for 100 through 999
100 sticks
rubber bands
pennies, nickels, dimes, quarters, dollar bills
articles with price tags less than 50¢
10 blocks
play money
flannel or magnetic board

CAREER AWARENESS

Furniture Upholsterers [134]
Furniture upholsterers repair various parts of furniture pieces such as chairs and sofas. These people might work in small shops, large stores, or factories. Some furniture parts that might be replaced are springs, fabric, and frames. Some tools that might be used are tack removers, chisels, mallets, pliers, and shears. Skilled upholsterers usually start as apprentices or helpers in an upholstery shop and learn on the job.

It is important that children develop an awareness of self and others. Children should realize that furniture upholsterers are aware of people with every piece of furniture they repair. A chair or sofa must be repaired to hold the weight of any individual. Other pieces are adjusted so they won't crumple under the weight of objects and perhaps hurt somebody. Upholsterers sometimes deal directly with customers as well. They must be able to assist people in finding what they want in terms of fabric, designs, etc.

Photo description: To recondition this chair, the furniture upholsterer has placed it on two wooden horses while using steel wool to remove the old furniture polish, wax, and varnish. He will refinish the exposed wooden parts before he inserts new springs, padding, and fabric.

BULLETIN BOARD

1. Select children to help you make a large numeral chart for 100 through 199, similar to the chart on page 118. Yarn sold as gift wrapping tie might make a colorful and easily seen grid. Have children help pin numeral cards in the appropriate boxes on the grid.

2. Select a group of children for each of the following posters:

a) A poster showing the relationships of pennies and nickels to a dime.

Coin	Worth
10 pennies	10¢
2 nickels	10¢
1 nickel and 5 pennies	10¢
1 dime	10¢

b) A similar poster showing the relationships of pennies, nickels, and dimes to a quarter.
c) A similar poster showing the relationships of pennies, nickels, dimes and quarters to a half-dollar.

3. Select a group of children to make posters showing cutouts of priced articles less than 50¢ in newspaper advertisements (grocery and variety store sections). The children may use paper money (coins and dollar bills) and paste the appropriate amount of money next to the article.

SPECIAL NOTES

The use of colour on ten-boxes and single blocks is used in two ways as an aid to understanding place value: 1) In all place value lessons each colour represents a different place in a numeral. For example, in 2 hundreds + 4 tens + 8, 2 hundred-boxes for the hundreds place, are all one colour, 4 ten-boxes for the tens place are all one colour; and 8 single blocks for the ones place are another colour. 2) In lessons on comparing numbers, each number is represented by a different colour. For example, in comparing 84 and 48, boxes and blocks for 84 are all one colour; and boxes and blocks for 48 are another colour.

OBJECTIVES

To know that 10 tens is 1 hundred
To tell the number of hundreds in a set of hundred-boxes

PACING

Level A	All (guided)
Level B	All (1–4 guided)
Level C	All (1–3 guided)

VOCABULARY

hundred, hundreds, hundred-box

MATERIALS

10 full ten-boxes, 4 full hundred-boxes

SUGGESTIONS

Initial Activities 1. Show 9 full ten-boxes. Have the child count the blocks by tens to 90. Then join one block at a time to the set until there are 100 blocks. Have the child tell the number of blocks each time. Discuss the ideas:

a. 10 ten-boxes exactly fill a hundred-box.
b. 10 tens in one hundred. Write 10 tens = 1 hundred.

2. Show 2, 3, and then 4 full hundred-boxes. Each time have the child tell the number of hundreds.

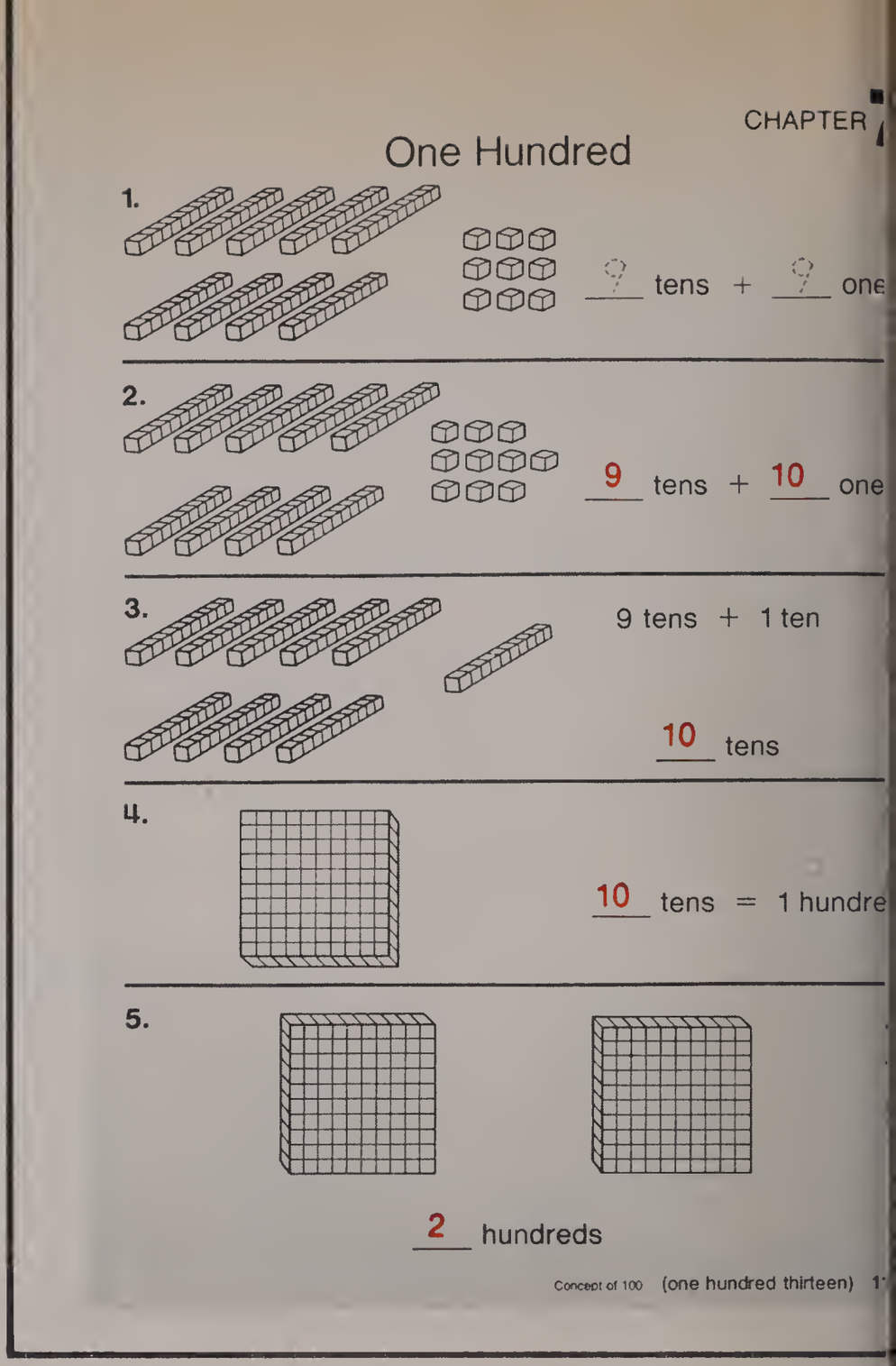
ACTIVITIES

1. Give the child 8 ten-boxes of blocks and 20 loose blocks. Have the child count the blocks (count the tens first and continue counting by ones: . . . , 60, 70, 80, 81, 82, 83, . . . , 100).

2. Give the child 99 small objects to group by tens. The child should discover that 1 more object is needed to make 100.

3. Give the child 199 small objects to group by tens. The child should discover that 1 more is needed to make 200.

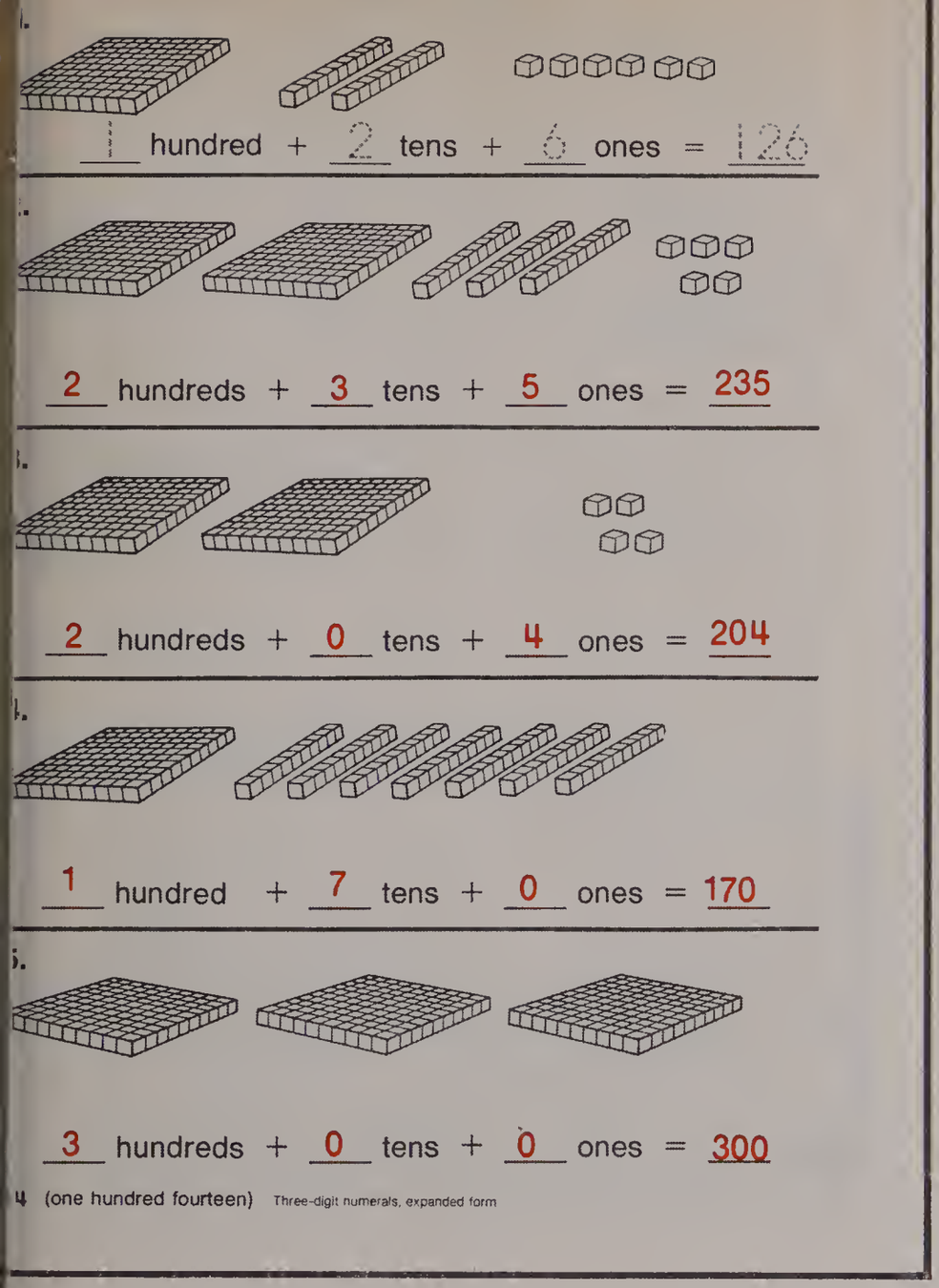
4. Ask, "What number is one less than 99? (98) What number is one greater than 99? (100)"



Using the Book Panels 1–3: For each panel, have the child give the number of ten-boxes and the number of blocks. Fill in the blanks. For panel 3, have the child observe that the loose blocks in panel 2 have been put in a ten-box. Then ask, "Ten ones is equal to how many tens? (1) Nine tens plus 1 ten is how many tens? (10)"

Panel 4: Develop the idea that the picture shows the same blocks as in panel 3. The ten-boxes in panel 3 have all been put into one big box called a hundred-box. Ask, "How many tens make a hundred? (10)" Have the child write 10 in the blank. Develop the idea that 1 hundred is one more than 9 tens + 9 ones by a sequence of questions using the pictures in panels 2, 3, and 4.

Panel 5: Have the child give the number of hundred-boxes of blocks.



Using the Book Panel 1: Ask the child to tell how many hundred-boxes, how many ten-boxes, and how many blocks there are. Have the child trace answers as they are discussed. Read the expanded numeral as "1 hundred plus 2 tens plus 6 ones is equal to one hundred twenty-six." Tell the child that there are 126 blocks. Write 126 on the chalkboard and tell the child that this is the three-digit numeral for one hundred twenty-six. Then have the child touch the three-digit numeral. Ask, "What digit is in hundreds place? (1) In tens place? (2) In ones place? (6)"

Panels 2-5: For each panel, have the child complete the expanded numeral and write the corresponding three-digit numeral.

OBJECTIVES

To complete an expanded numeral
To write a three-digit numeral for an expanded numeral

PACING

Level A	All (1-2 guided)
Level B	All (1-2 guided)
Level C	All (1 guided)

VOCABULARY

three-digit numeral

MATERIALS

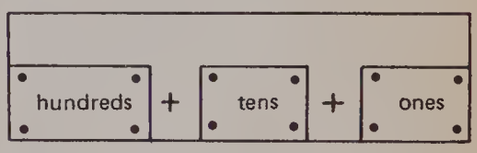
numeral cards 0-9, and word cards for hundreds, tens, ones

SUGGESTIONS

Initial Activity Use the numeral and word cards and assist the child in showing the expanded numeral for 243. Develop and write the three-digit numeral. Ask, "What digit is in the ones place? (3) The tens place? (4) The hundreds place? (2)" Repeat the activity for 425.

ACTIVITIES

1. Construct a pocket chart to show:



Distribute numeral cards for 0 to 9. Have one child place numerals in the pockets for hundreds, tens, and ones. Then for each expanded numeral, another child writes the three-digit numeral.

2. Have the child play a ring toss game. Have one pole for 100's, another for 10's, and another for 1's. The child tosses cardboard rings and writes a numeral for the score.

3. Have the child play the ring toss game described above.

RELATED AIDS

ACT. MASTERS—Gen. Use 3, 4.

OBJECTIVES

To write the numerals 100, 200, . . . , 900
To count by hundreds through 900

PACING

Level A	All (1-2 guided)
Level B	All (1-2 guided)
Level C	All (1 guided)

MATERIALS

9 full hundred-boxes, 10 full ten-boxes

SUGGESTIONS

Initial Activities Show 10 ten-boxes of blocks and show that they fill a hundred-box. Write: 1 hundred = ___ tens
Have the child complete the sentence.
Write:
1 hundred + 2 tens + 6 ones = 126
1 hundred + 0 tens + 0 ones = ___
Have the child write the three-digit numeral for one hundred.

You may have the child count 9 hundred-boxes of blocks by hundreds while another child writes the three-digit numerals as each hundred is counted.

ACTIVITIES

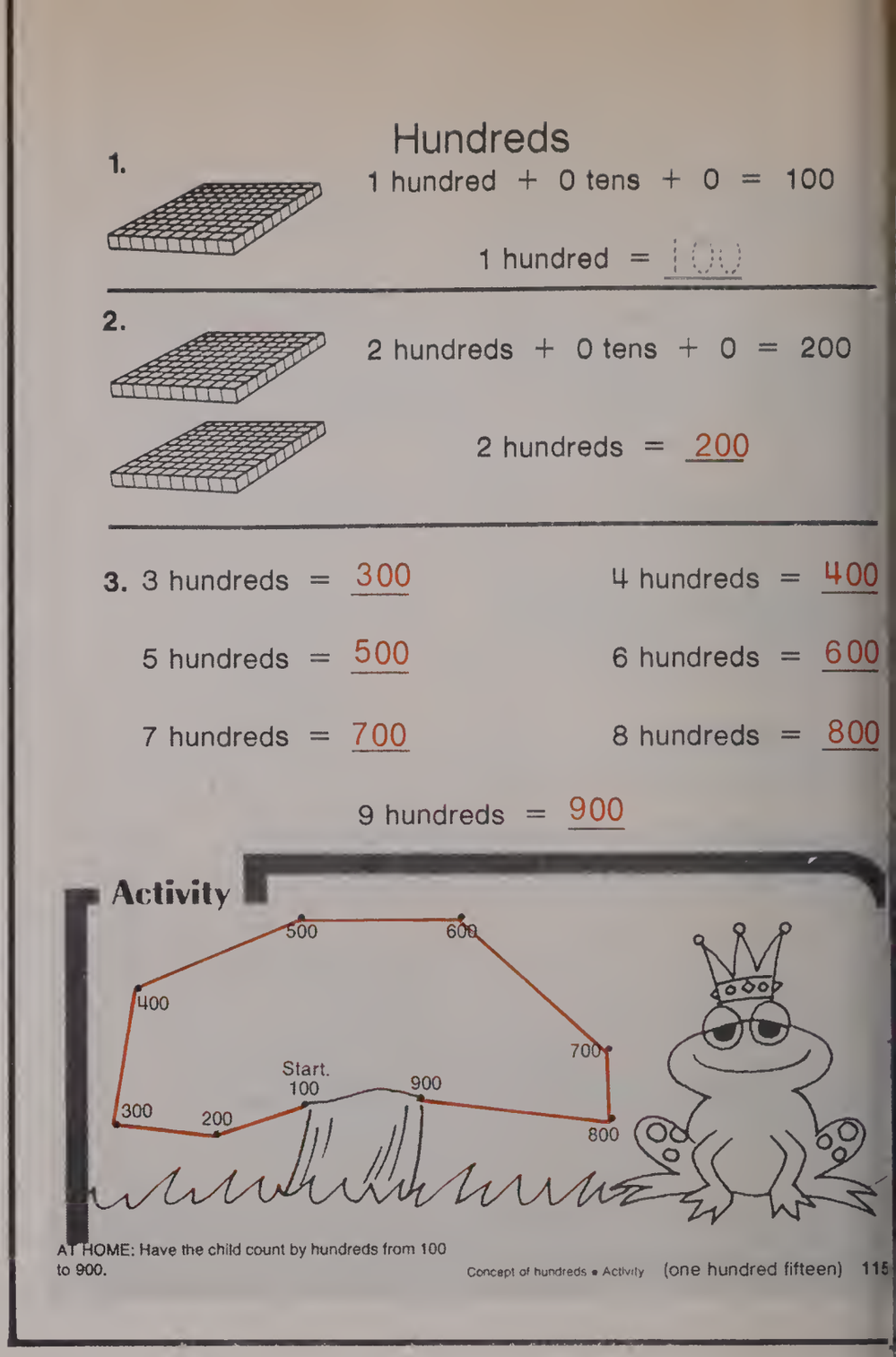
1. Place numeral cards for 100 through 900 in random order on a table. Have the child arrange them in order to show counting by hundreds.

2. Two children may take turns in this activity. One child writes a three-digit numeral for one of the hundreds, say 400. Then the other child must show that many hundred-boxes of blocks and count them by hundreds.

3. If the child is capable, let the child demonstrate counting past one hundred, beginning with 90. Then the child may begin with 190 and count past 200.

RELATED AIDS

ACT. MASTERS—Gen. Use 3, 4.



Using the Book Panel 1: Ask, "How many blocks are in 1 hundred-box? (100) Then call attention to panel 1. Ask, "How many hundred-boxes? (1) How many ten-boxes? (0) How many ones? (0)" Assist the child in reading the two sentences, then trace 100. Explain that this is the three-digit numeral for one hundred.

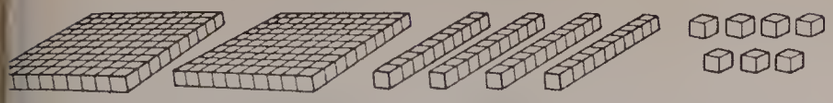
Panel 2: You may ask the child to relate the expanded numeral to the picture. Ask, "How many hundred-boxes? (2) How many ten-boxes? (0) How many blocks? (0)" Point out that there are no ten-boxes, hence 0 tens, and no blocks, hence 0 ones. Tell the child to touch the three-digit numeral in the first row. Ask, "What digit is in hundreds place? (2) In tens place? (0) In ones place? (0)" Have the child write the three-digit numeral that goes with 2 hundreds.

Panel 3: Have the child write the three-digit numeral for each number.

Activity: Have the child connect the dots in order, starting with 100. The picture shows a toadstool.

At Home Upon completion of the pupil page, the child may take the page home and do the At Home activity suggested at the bottom of the page.

Reading Hundreds, Tens and Ones



2 hundreds + 4 tens + 7

200 + 40 + 7

247

. 3 hundreds + 7 tens + 4 300 + 70 + 4 374	**3.** 6 hundreds + 0 tens + 2 600 + 0 + 2 602
. 4 hundreds + 2 tens + 0 400 + 20 + 0 420	**5.** 1 hundred + 1 ten + 3 100 + 10 + 3 113
. 5 hundreds + 8 tens + 1 500 + 80 + 1 581	**7.** 2 hundreds + 0 tens + 5 200 + 0 + 5 205
. 3 hundreds + 3 tens + 3 300 + 30 + 3 333	**9.** 7 hundreds + 5 tens + 0 700 + 50 + 0 750

Using the Book Panel 1: Have the child relate the first expanded numeral to the set of blocks. Ask, "How many hundred-boxes? (2) How many ten-boxes?(4) How many blocks? (7)" Write on the chalkboard: 2 hundreds + 4 tens + 7

__ + __ + 7

___

Have the child complete the second expanded numeral and write the three-digit numeral. Have the child read the second expanded numeral. Tell the child that this three-digit numeral is read just like the second expanded numeral except we leave out the plus signs: two hundred forty-seven. Follow similar procedures for reading numbers when there are no tens or no ones such as: 508 (500 + 8, five hundred eight) and 370 (300 + 70, three hundred seventy).

Panels 2-9: Have the child write another expanded numeral and the three-digit numeral in each panel.

OBJECTIVES

To write expanded numerals like
300 + 70 + 4
To write and read three-digit numerals

PACING

Level A (Initial Activities only)
Level B All (1-5 guided)
Level C All (1-3 guided)

MATERIALS

3 full hundred-boxes, 2 full ten-boxes, 6 blocks

SUGGESTIONS

Initial Activity Show 3 hundred-boxes, 2 ten-boxes, and 6 blocks. Have the child complete the expanded numeral for the number of blocks and write the three-digit numeral.

3 hundreds + 2 tens + 6 ones
__ + __ + 6

It is not required that the student write "6 ones". However, the teacher should emphasize that the 6 means "6 ones" by verbalizing it wherever it occurs.

Have the child give the three-digit numeral for 3 hundreds and the two-digit numeral for 2 tens. Have the child read each row of number names, explaining that the three-digit numeral is read like the second row without saying "plus."

The child should practice reading three-digit numerals.

ACTIVITIES

1. Involve children in the pocket chart game described on page 114.

2. Two children may assist each other in reading and writing three-digit numerals. One child writes a three-digit numeral and the other child reads the numeral.

3. Have the child write and read the number that is one greater (or one less) than each number on page 116.

RELATED AIDS

ACT. MASTERS—Gen. Use 3, 4.

OBJECTIVE

To write three-digit numerals

PACING

Level A	All (first 3 in each panel guided)
Level B	All (first 2 in each panel guided)
Level C	All (first 1 in each panel guided)

MATERIALS

5 full hundred-boxes, 9 full ten-boxes, 9 blocks

SUGGESTIONS

Initial Activities 1. Show 523 blocks. Have the child show the expanded numeral, write the three-digit numeral, and read it. Ask, "What place is the 3 in? What place is the 2 in? What place is the 5 in?"

2. You may draw a table similar to the one in Panel 2, page 117. Tell the child it is another way to show hundreds, tens, and ones. Have the child write the three-digit numerals.

ACTIVITIES

1. Write 506 and 560. Have the child show a set of blocks for each number. Ask, "Which set has more blocks?"

2. Write 208. Ask the child to read the numeral and find that page in the book. Then have the child give the page numbers on the next five pages.

3. For each number in Panel 1, have the child give the number that is ten greater.

RELATED AIDS

ACT. MASTERS—Gen. Use 3, 4.

Place Value

Complete.

1. 1 hundred + 2 tens + 8 = 128

5 hundreds + 7 tens + 4 = 574

3 hundreds + 0 tens + 9 = 309

2 hundreds + 6 tens + 0 = 260

4 hundreds + 0 tens + 0 = 400

6 hundreds + 3 tens + 1 = 631

2. Write three-digit numerals.

hundreds	tens	ones	three-digit numeral
2	8	5	285
3	2	0	320
1	0	0	100
6	9	9	699
9	0	6	906

Place value. writing three-digit numerals (one hundred seventeen) 11

Using the Book Panel 1: Have the child read the expanded numeral and trace the three-digit numeral, 128, in the first row. Ask, "What digit is in the hundreds place? (1) In the tens place? (2) In the ones place? (8)" Have the child write the three-digit numeral that goes with each expanded numeral.

Panel 2: Have the child read the headings in each white column. (hundreds, tens, ones) Explain that each row shows the hundreds digit, the tens digit, and the ones digit of a three-digit numeral. Have the child name the digits in each column in the first row and trace the three-digit numeral, 285. Have the child write the three-digit numeral in each row.

A Numeral Chart

109	119	129	139	149	159	169	179	189	199
108	118	128	138	148	158	168	178	188	198
107	117	127	137	147	157	167	177	187	197
106	116	126	136	146	156	166	176	186	196
105	115	125	135	145	155	165	175	185	195
104	114	124	134	144	154	164	174	184	194
103	113	123	133	143	153	163	173	183	193
102	112	122	132	142	152	162	172	182	192
101	111	121	131	141	151	161	171	181	191
100	110	120	130	140	150	160	170	180	190

Using the Book Tell the child to write the numerals, in order, from 100 through 199. Numerals are given in the first, second, fifth, seventh, and ninth rows so that the child may have check points. The children may place this page in a workbook for a reference in the future.

OBJECTIVE

To know the order of numbers through 199

PACING

Level A	All (guided)
Level B	All (guided)
Level C	All

MATERIALS

19 full ten-boxes, 9 blocks, an empty ten-box, an empty hundred-box

SUGGESTIONS

Initial Activities 1. Use blocks to develop the order of numbers 90 through 110, then 140 through 153, then 185 through 199. Have the child write the three-digit numerals.

2. Ask questions such as, "When counting, what number comes just before 130? Just after 130? Just before 179? Just after 179?"

ACTIVITIES

1. Involve children in Bulletin Board suggestion 1 in Chapter Overview.

2. Have two children take turns in counting from 90 to 150. Ask one child to begin counting with 90. When the child says "100," say "stop." Then ask the other child to continue counting. You may have the children take turns after giving eleven or twelve numbers.

3. Adapt the game Pop Up described in the Activity Reservoir for practice in counting.

4. It might be a unique experience for the child to show 199 of some things, such as buttons, rocks, or bottle tops. Have children work in groups and paste their collections to large posters or group objects in tens for display.

OBJECTIVE

To know the order of numbers through 499

PACING

Level A All (1 guided)
Level B All
Level C All

MATERIALS

numeral chart for 100 through 499

SUGGESTIONS

Initial Activities 1. Display a large chart for 100 through 499. Ask the child to touch 127. Ask, "When counting, what number comes just after 127? Just before 127? Just after 227? Just before 227?" Continue the questioning pattern for 140, 240, 340, and 440.

2. As the child counts from 196 through 202, write:
196 197 198 __ __ __ __ __ __ __
Have the child write the numerals in the blanks to continue the pattern.

Repeat the activity for 296 and 396.

ACTIVITIES

1. Play the Pop Up game described in the Activity Reservoir for counting from 196 to 225.

2. Read numerals similar to the following and have the child write them: 234, 450, 130, 319, 208, 444, 303, and 399.

3. Give the child experience in estimating. Put buttons or small objects (100 to 200) into an empty cigar box. Have the child guess how many, then count to get the answer and write the correct number.

4. Adapt the estimating activity above. Give the child more than 400 but 1 less than 500 buttons or objects.

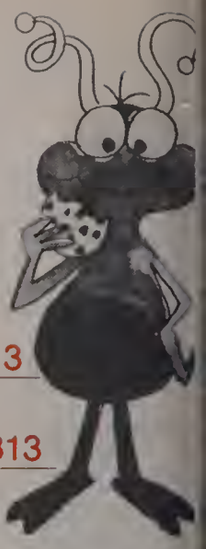
Write the missing numerals.

1.

___	___	200	201	202
___	___	300	___	302
___	___	400	401	___

2.

___	___	___	211	212	213
___	309	310	311	___	313
___	409	410	___	412	



3. Write the numerals from 200 through 229.

			203	204	205	206	207	208	209
	211	212		214	215	216	217	218	219
220		222	223	224		226	227	228	229

4. Write the numerals from 470 through 499.

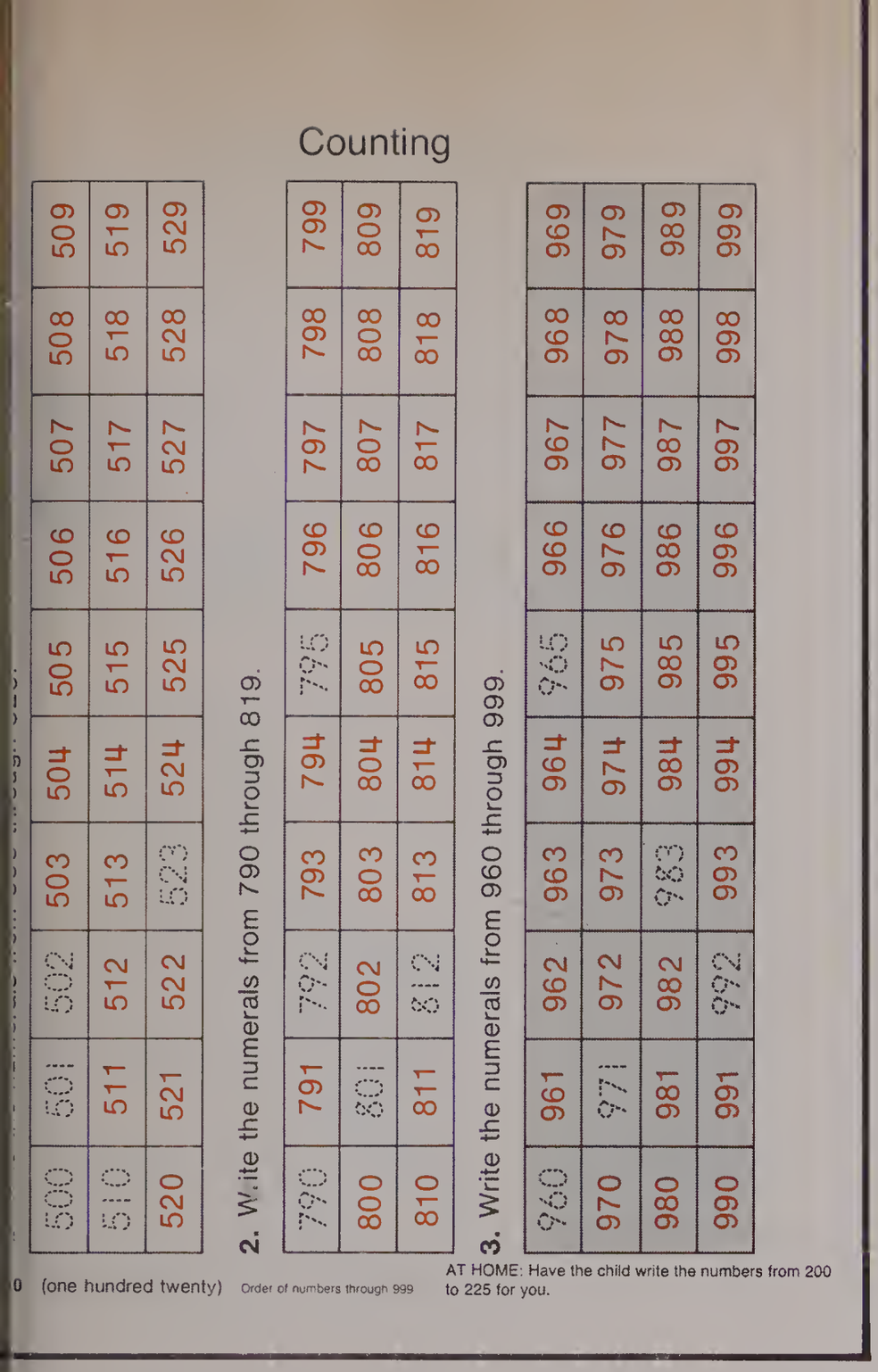
	471	472		474	475		477	478	479
480		482	483		485	486	487	488	489
		492	493	494		496	497	498	499

Using the Book Panels 1–2: Tell the child to first look at the numbers given in each row, decide on the pattern of the numbers for that row, and then write the missing numerals. Remind the child that each hand starts a new sequence of numbers.

Panel 3: Have the child write the numerals, in order, from 200 through 229.

Panel 4: Have the child write the numerals, in order, from 470 through 499.

When assignment is completed, you may have the child practice reading th three-digit numerals in panels 3 and 4.



Using the Book Panel 1: Have the child write the numerals, in order, from 500 through 529.

Panel 2: Have the child write the numerals, in order, from 790 through 819.

Panel 3: Have the child write the numerals, in order, from 960 through 999.

When the assignment is completed, you may have the child practice reading three-digit numerals by reading the numerals in panel 1.

At Home Upon completion of the pupil page, the child may take the page home and do the At Home activity suggested at the bottom of the page.

OBJECTIVE

To know the order of numbers through 999

PACING

Level A All
Level B All
Level C All

MATERIALS

numeral chart through 999

SUGGESTIONS

Initial Activity Display a large chart for 100 through 499 (and through 999 if available). Have the child touch 136. Ask, "When counting, what number comes just after 136? Just before 136?" Ask the same question about each of these: 236, 536 and 936. Then ask the same questions about 100, 400 and 900; then 9, 19, 199, 299, 699.

ACTIVITIES

1. Three children may play this game. One child shows a numeral card for a number less than 999. The second child gives the number that comes just before, and the third child gives the number that comes just after.

2. Give the child a shuffled deck of about fifty to one hundred sequentially numbered cards through 999. Have the child arrange the cards in order.

3. Challenge the child to try to count his or her steps in going to or from school; to or from the classroom to the school, library, or cafeteria.

RELATED AIDS

ACT. MASTERS—22.

OBJECTIVE

To compare two numbers each less than 999

PACING

Level A	All (1–2 guided)
Level B	All (1–2 guided)
Level C	All (1–2 guided)

MATERIALS

9 full hundred-boxes, 12 ten-boxes, 9 blocks

BACKGROUND

See the Chapter Overview Background.

SUGGESTIONS

Initial Activity Use blocks to develop the ideas that the set with more hundred boxes has more hundreds and so, is the greater number. Then ask, "Which number comes first when counting 178 or 512? (178) Which is greater? (512)" Repeat the activity using: 429, 600; 196, 203; and 732, 496.

ACTIVITIES

1. Using numeral cards for three-digit numerals, have the child arrange them in order from greatest to least and vice versa.

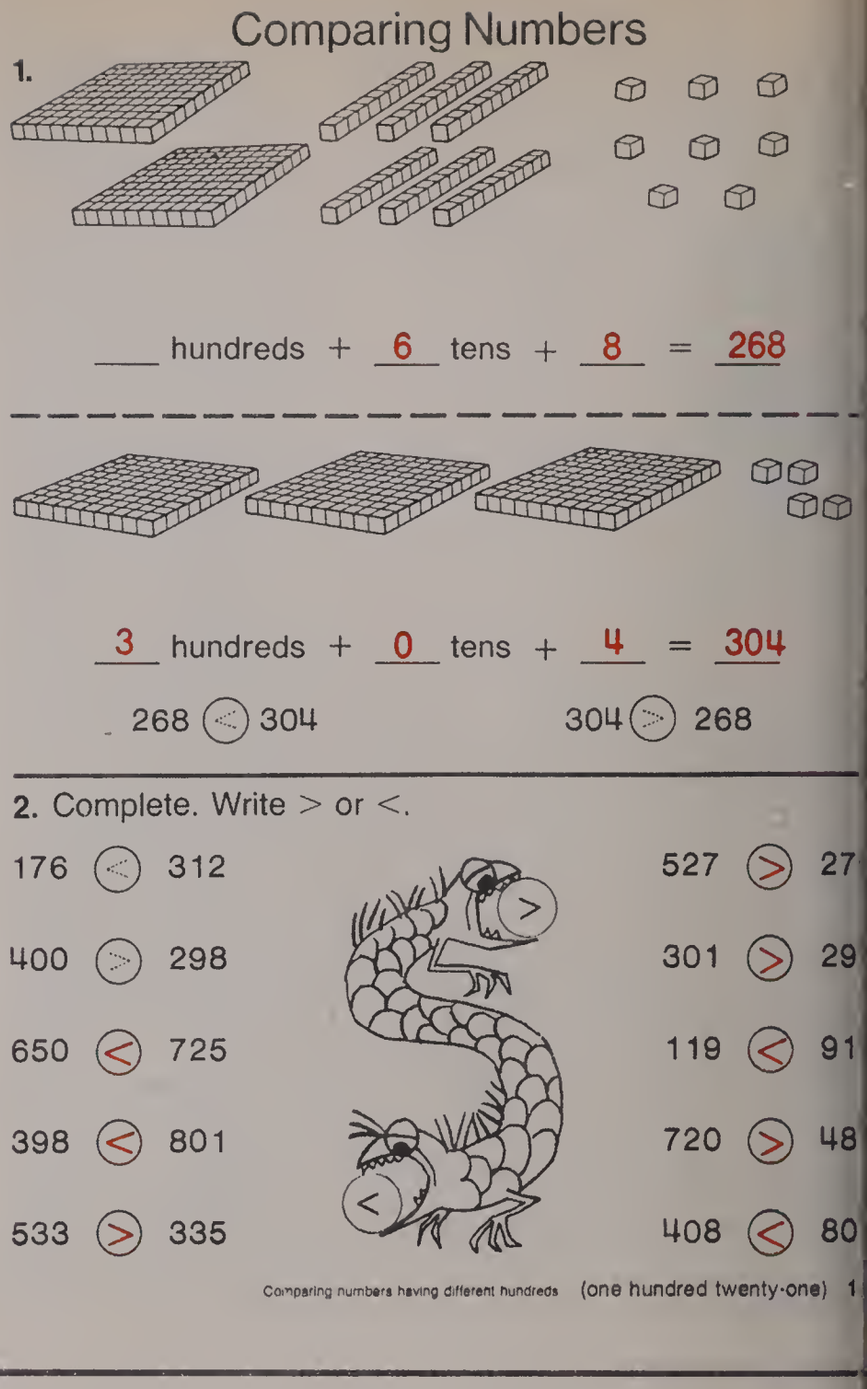
2. Have the child practice making true sentences, similar to those in panel 1, using flannel or magnetic board numbers (less than 999) and a flannel or magnetic strip for signs > or <.

3. Have the child play Battle described in the Activity Reservoir.

4. Taking turns, have one child give a number orally while the other child writes that numeral and the number that comes just before and after it. Eventually, ask, "What number comes after 999 when counting?"

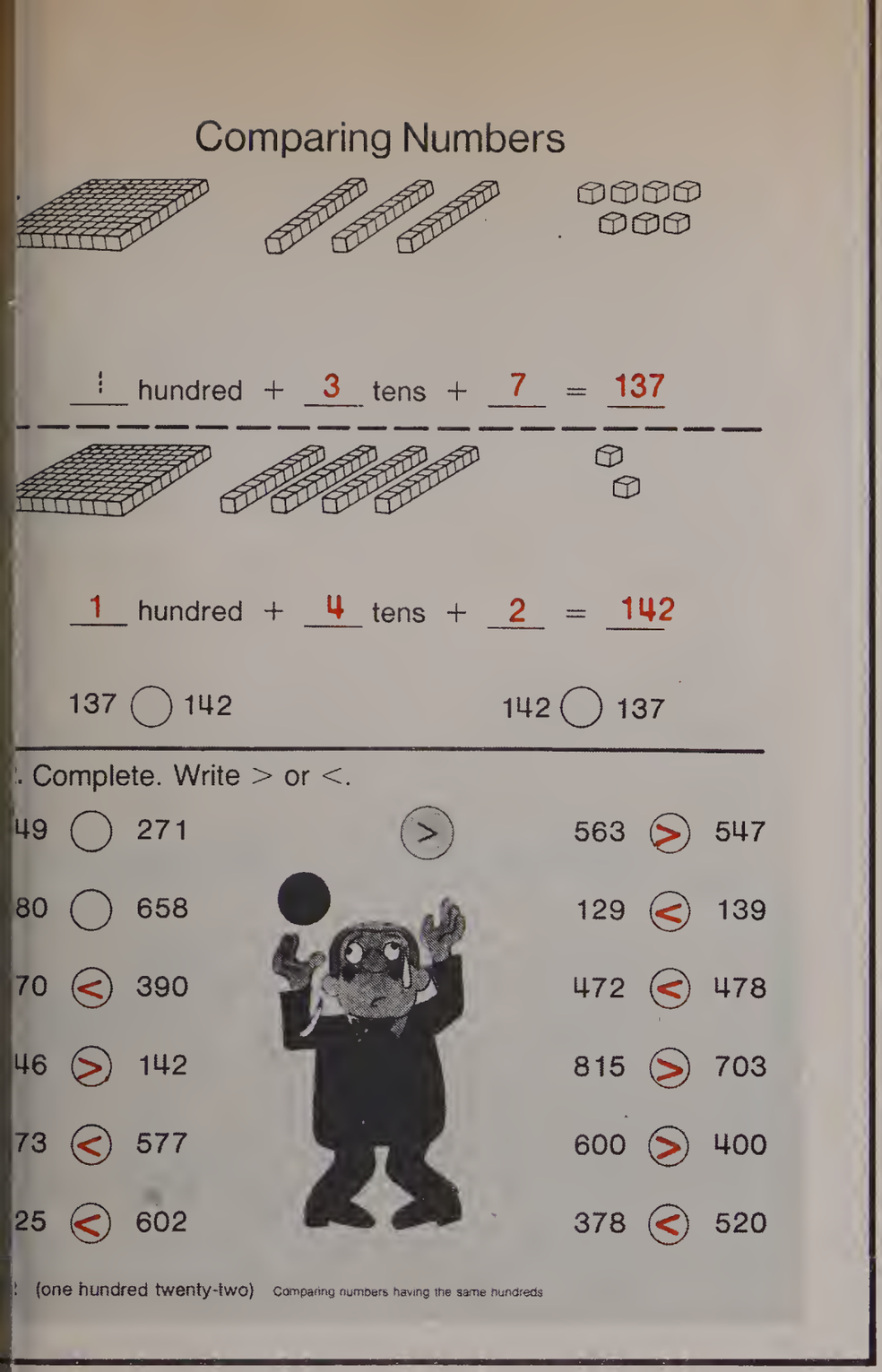
RELATED AIDS

BFA COMP LAB I—44.



Using the Book Panel 1: Have the child complete the expanded numeral and write the three-digit numeral for the number of blue blocks. Then have the child complete the expanded numeral and write the three-digit numeral for the number of red blocks. Then tell the child to compare the number of blue blocks and the number of red blocks. Ask, "Which set has more hundred-boxes? (red set)" Explain that the set with more hundred-boxes has more hundreds and therefore is the greater number. Ask, "Which number has more hundreds, 268 or 304? (304)" Have the child read each sentence at the bottom of the panel and trace over the > and < signs. Read: 268 is less than 304; 304 is greater than 268.

Panel 2: Have the child write > or < in each ring to make true sentence. Remind the child to compare hundreds.



Using the Book Panel 1: Have the child complete the expanded numeral and write the three-digit numeral for the number of yellow blocks, then do the same for the number of red blocks. Have the child compare the number of yellow blocks and the number of red blocks. Ask, "Do the sets have the same number of hundred-boxes? (yes) Which set has more ten-boxes? (red set) Which number has more tens, 137 or 142? (142)" Explain that if two numbers have the same hundreds, the number that has more tens is greater. Ask, "Which number is greater, 137 or 142? (142) Which number is less? (137) Which number comes first when counting? (137)" Ask the child to read the sentences at the bottom of the panel and trace over the > and < signs.

When the panel is completed, cover one of the red ten-boxes so the set shows 132. Then use the procedure above to explain that if two numbers have the same number of hundreds and the same number of tens, you compare the ones. Thus 137 > 132.

Panel 2: Have the child make true sentences.

OBJECTIVE

To compare two numbers each less than 999

PACING

Level A	All (guided)
Level B	All (guided)
Level C	All (guided)

MATERIALS

9 full hundred-boxes, 12 ten-boxes, 9 blocks

SUGGESTIONS

Initial Activities 1. Have the child write 329 and 351. Ask, "Do they show the same number of hundreds? (yes) Do they show the same number of tens? (no) Which set has more tens? (the set with 351 blocks) Which number is greater, 329 or 351? (351) Which number comes first when counting? 329 or 351? (329)"

2. Repeat the activity using 342 and 347, stressing that when two numbers have the same hundreds, and the same tens, we compare the ones to decide which number is greater.

ACTIVITIES

1. Have two children play the computer game. One child pretends to be a computer. The other child displays two cards such as 125 and 127. The computer must show or tell the number that comes between 125 and 127. (Vary the game for before and after concepts.)

2. Have the child play Battle described in the Activity Reservoir.

3. Challenge the child to give the greatest and the least three-digit number having the digits 3, 5, and 7.

RELATED AIDS

BFA COMP LAB I—44.

OBJECTIVE

To count by fives through 995

PACING

Level A (Initial Activities only)
Level B All (1-2 guided)
Level C All

MATERIALS

100 sticks, rubber bands

SUGGESTIONS

Initial Activity Show 50 sticks. Have the child guess the number. Let the child group the sticks by fives, using rubber bands, and then count the sticks by fives. Write the numerals in a row.

5 10 15 . . . 50

Then have the child begin with 55 and count by fives through 100. Write the numerals in a second row.

5 10 15 . . . 45 50
55 60 65 . . . 95 100

Ask the child to count by fives from 105 through 150. Write the numerals in the third row. Continue in this manner until you think the child understands the pattern for counting by fives.

ACTIVITIES

1. A large numeral chart may be used to practice counting by fives. The child may touch or circle each numeral 0, 5, 10, 15, . . . as he or she counts by fives.

2. Using numeral cards, have the child sort all cards that show counting by fives.

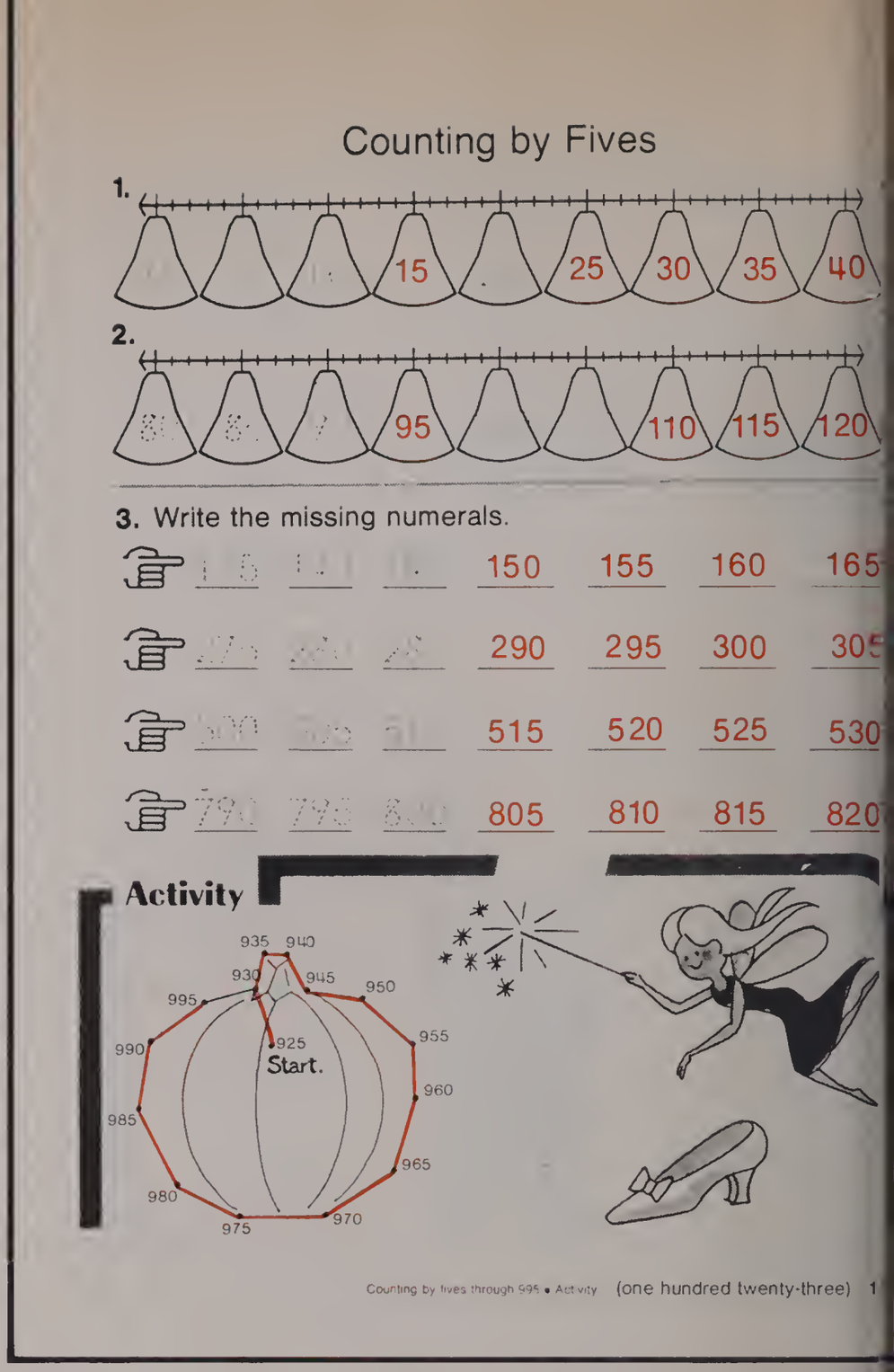
3. Have the child play Zip Up described in the Activity Reservoir to count by fives from 350 to 420.

4. Have the child count by fives to twenty-five. Then ask, "How many fives are in twenty-five?" Distribute 25 sticks to be grouped by fives to verify the answer. Extend this activity with the number 35.

5. Challenge the child to begin with 2 and count by fives to 57.

RELATED AIDS

BFA COMP LAB I—26.

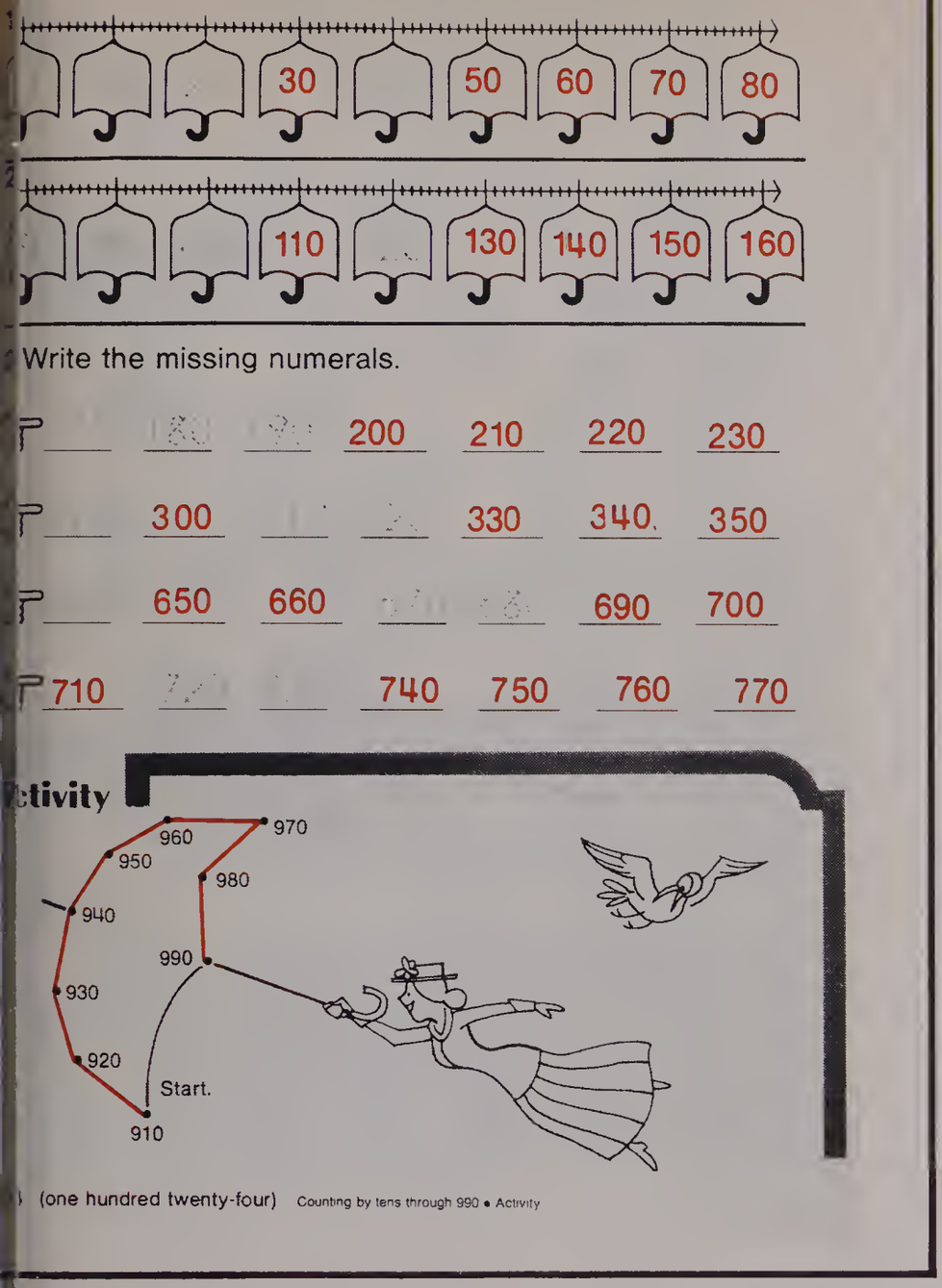


Using the Book Panel 1: Tell the child that each bell is 5 marks away from the next bell on the number line. Begin with 0 and have the child count the marks to the next bell and say the number. (5, 10, 15, 20) Then have the child trace those numbers and continue writing the numerals used in counting by fives.

Panel 2: Have the child begin with 80 and write numerals used in counting by fives.

Panel 3: Have the child write the missing numerals in each row to show counting by fives greater than one hundred. Tell the child to first look at each row to decide on the pattern. Remind the child that each hand starts a new sequence.

Activity: The child must be able to count by fives to make the dot picture that starts at 925. Children might enjoy colouring the picture of Cinderella when finished.



sing the Book Panel 1: Tell the child that each umbrella is 10 marks away om the next umbrella on the number line. Begin with 0 and have the child unt the marks to the next umbrella and say the number. (10) Continue to). Then have the child trace those numbers and continue writing numerals used counting by tens.

Panel 2: Have the child begin with 80 and write numerals used when unting by tens.

Panel 3: Have the child write the missing numerals in each row to show unting by tens for numbers greater than 100. Tell the child to first look at ch row to decide on the pattern. Remind the child that each hand starts a w sequence.

Activity: Have a child make a picture by connecting the dots that are mbered by tens. Children might enjoy coloring the picture of Mary Poppins hen finished.

OBJECTIVE

To count by tens through 990

PACING

Level A (Initial Activities only)
Level B All (1-2 guided)
Level C All

MATERIALS

11 ten-boxes of blocks

SUGGESTIONS

Initial Activity Display 11 ten-boxes of blocks. Assist the child in counting the blocks by tens. Have the child count the blocks by tens again. This time write, or have a child write, the numerals as the blocks are counted: 10, 20, 30, . . . 100, 110. Then have the child write the missing numerals to show counting by tens from 310 to 410. Write:

310 320 330 ___ ___ ___
___ ___ ___ ___ 410.

ACTIVITIES

1. Have the child sort numeral cards to show counting by tens.

2. Have the child write the numeral for each of the following sets as you show the sets one by one. Begin with 1 ten-box of blocks and 6 blocks. (The child writes 16.) Include another ten-box. (The child writes 26.) Put another ten-box in the set. (The child writes 36.) Continue in this manner until the child has written 136. Have the child read the numerals. Tell the child, "You are counting by tens beginning with 16."

3. Have the child write the missing numerals to show counting by tens beginning with 342. Write: 342, 352, 362, ___ ___ ___ ___ ___ ___ ___ etc.

4. Play Zip Up described in the Activity Reservoir.

EXTRA PRACTICE

Practice Exercises p. 254.

RELATED AIDS

BFA COMP LAB I—27.

OBJECTIVES

To identify a penny, a nickel, and a dime

To know how many cents each of the coins above is worth

To select a set of coins worth as much as the cost of a given article

PACING

Level A	125 All (1-3, 15 guided) 126 All
Level B	125 All (1-3, 15 guided) 126 All
Level C	125 All (1-3, 15 guided) 126 All

VOCABULARY

penny, nickel, dime, cents, coin

MATERIALS

pennies, nickels, dimes, articles with price tags less than 50¢

SUGGESTIONS

Initial Activities 1. Display pennies, nickels, and dimes. Review the name of each coin and the sign ¢ for cents. As the child tells what each coin is worth, have the child write 1¢, 5¢, and 10¢.

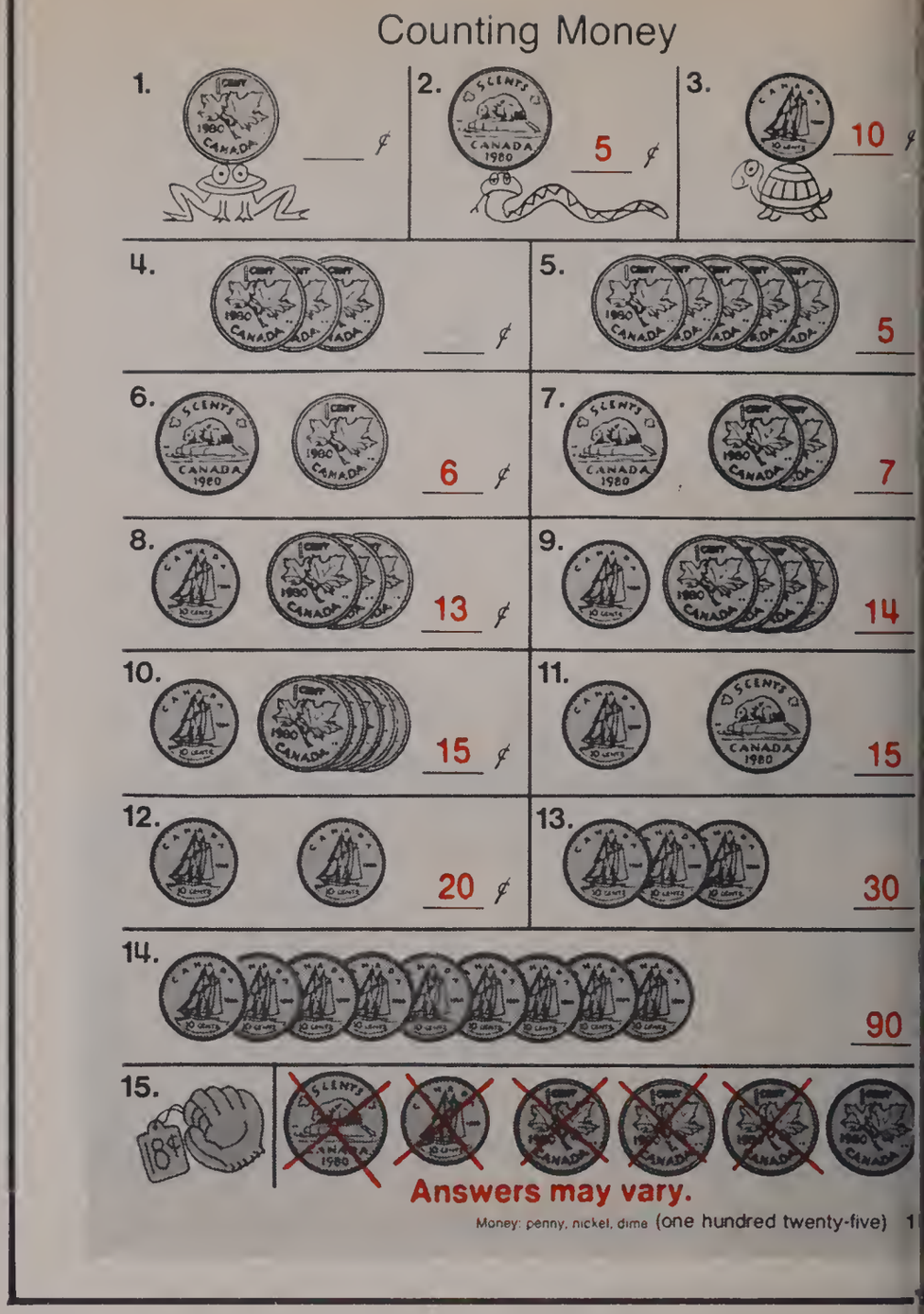
2. Have the child find the value of (a) sets of pennies, (b) sets of nickels through 95 cents (counting by fives), (c) sets of dimes through 90 cents (counting by tens).

3. Show a nickel and a set of 5 pennies. Develop the idea that a nickel is worth as much as 5 pennies.

4. Show a dime, a set of 10 pennies, and a set of 2 nickels. Develop the idea that any one set is worth as much as each of the others.

5. Show sets of coins, similar to those on text page 125. Have the child find and write how much each set is worth.

6. Display articles with price tags on them less than 50¢. Put a bunch of play coins on a table. For each article, have the child select a set of coins that will buy the article. In some cases there will be different combinations of coins for an article. Have the child find and compare these combinations.



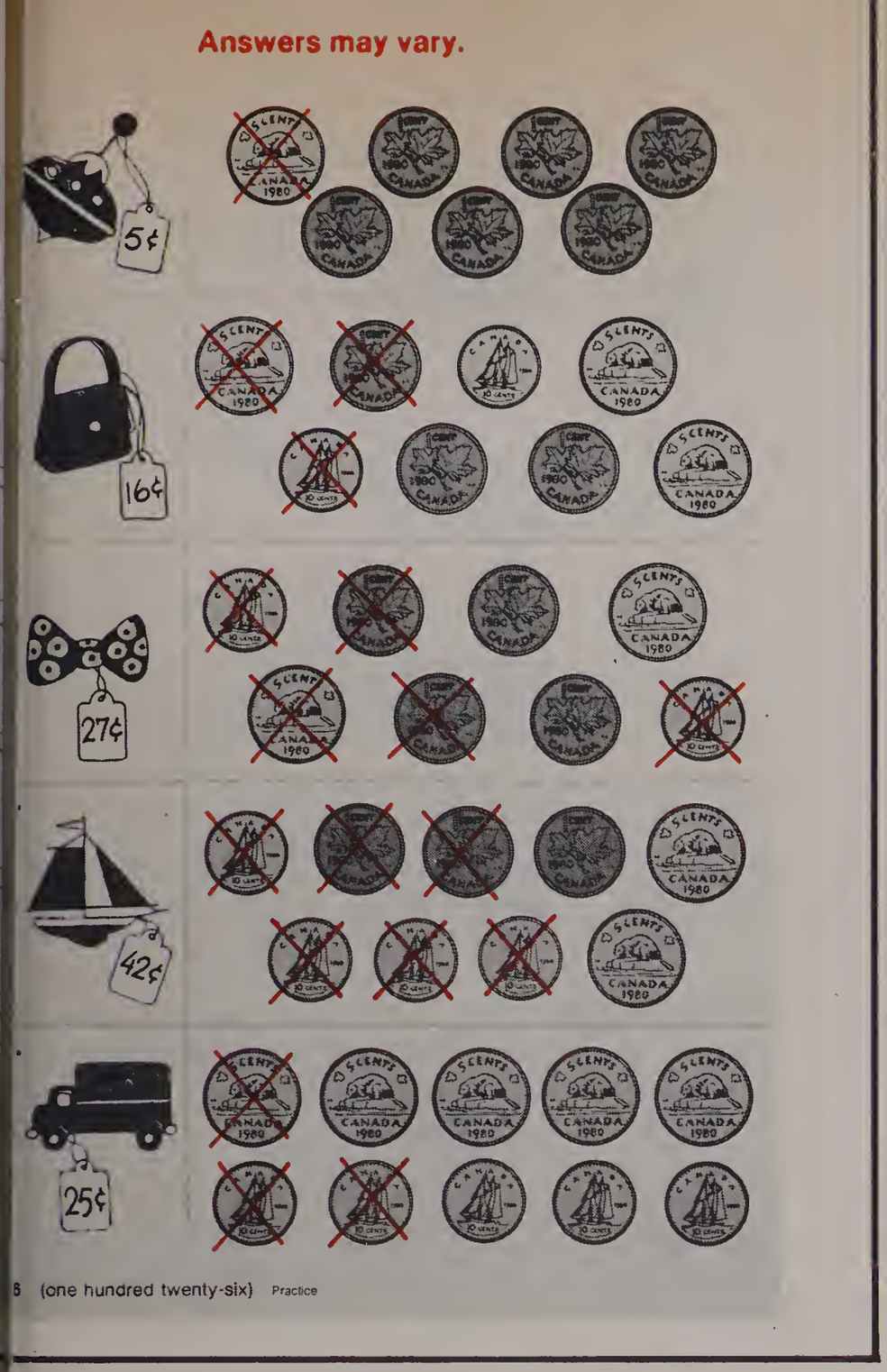
Using the Book Panels 1-3: Tell a story. "Each of the 3 animals has a coin." Ask, "What coin does the frog have? (penny) How much is a penny worth? (1¢) Trace 1 in the blank." Next, ask "What coin does the snake have? (nicke How much is a nickel worth? (5¢) Write 5." Then ask "What coin does the turtle have? (dime) How much is a dime worth? (10¢) Write 10."

Panels 4–5: Say, "Count the pennies; write the number of cents."

Panels 6–7: Ask, "How much is a nickel worth? (5¢) How much is a penny worth? (1¢)" Have the child touch the nickel and say five, then touch the penny and say six. Say, "A nickel and a penny are worth 6 cents. Write 6. Have the child complete panel 7.

Panels 8–14: Continue in the same manner with panel 8. In panels 12 through 14, tell the child to count by tens.

Panel 15: Have the child identify the picture. Ask, "How much does it cost? (18¢)" Have the child ring or X the set of coins that will buy the article.



Using the Book Panel 1: Have the child identify the picture. Ask, "How much does the toy top cost? (5¢)" Say, "If you had the coins at the right, which coins would you use to buy the top? (nickel or 5 pennies)" Have the child mark an X on each coin to show one set of coins that will buy the article. Since the answers will vary, you may wish to display the various choices the children made.

Panels 2–5: Assist the child in identifying each article and its cost. Then have the child complete the exercises as in panel 1.

Children's choices may vary. Allow time for discussion of the choices showing why the different choices are correct. This will be good practice in addition.

ACTIVITIES

1. It might be fun to set up a play store with articles having price tags. Include some grocery items. Let the children take turns being the store clerk while other children use play money to buy articles.

2. The child might enjoy looking in newspapers and magazines for pictures of articles with price tags less than 50¢. The child may cut them out and display them on the worktable.

3. Involve the child in Bulletin Board suggestion 2a in the Chapter Overview. (This Bulletin Board display has three sections.)

4. Have two children play the computer game. One child shows some play money, the other child (the computer) counts it.

5. Have the child play Bingo as described in the Activity Reservoir. Fill the cells with amounts of 50 cents or less. Hold up or use a transparency to show combinations of coins (pennies, nickels, dimes). The child covers the appropriate cells for the pictured coins.

6. Challenge the child to find how much a set of 15 dimes is worth.

OBJECTIVE

To determine how many more cents are needed, given the cost of an article and a set of coins

PACING

Level A	127 All (1-3 guided) 128 All
Level B	127 All (1-2 guided) 128 All
Level C	127 All (1 guided) 128 All

MATERIALS

pennies, nickels, dimes, articles with price tags less than 50¢.

SUGGESTIONS

Initial Activities 1. Display some pennies, nickels, and dimes. Write 8¢. Have the child find different ways to show 8¢. Write 12¢, then 18¢ and challenge the child to find various ways to show each amount.

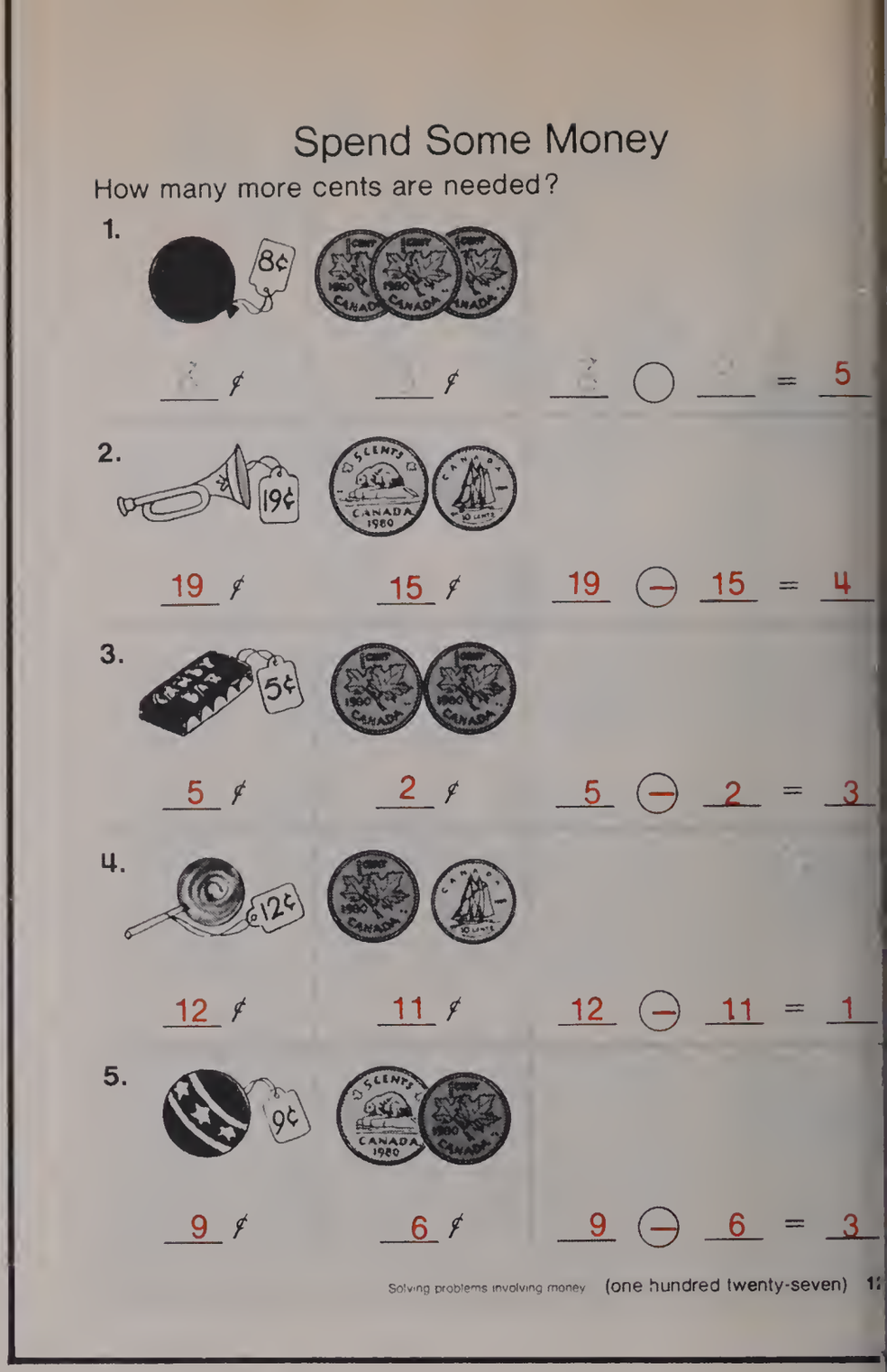
2. Dramatize problems similar to those on pages 127 and 128. For example, show an article that costs 10¢. Show a nickel and a penny and tell the child that you have this much money. Ask, "How many more cents are needed to buy the article? How much does the article cost?" Write 10¢ ○ 6¢ = ___.

Develop the idea we may subtract to find how many cents are needed. Write 10 - 6 = ___ and have the child find the answer. The child may add 4 pennies to the set to verify the answer.

3. You might want to discuss the consumer aspects of this page by asking questions about comparison shopping. Ask, "Which is a better buy?"

a) candy: 2 for 1¢ or 1¢ each
b) bubble gum: 3 for 5¢ or 2¢ each
c) cookies: 3 for 10¢ or 3¢ each

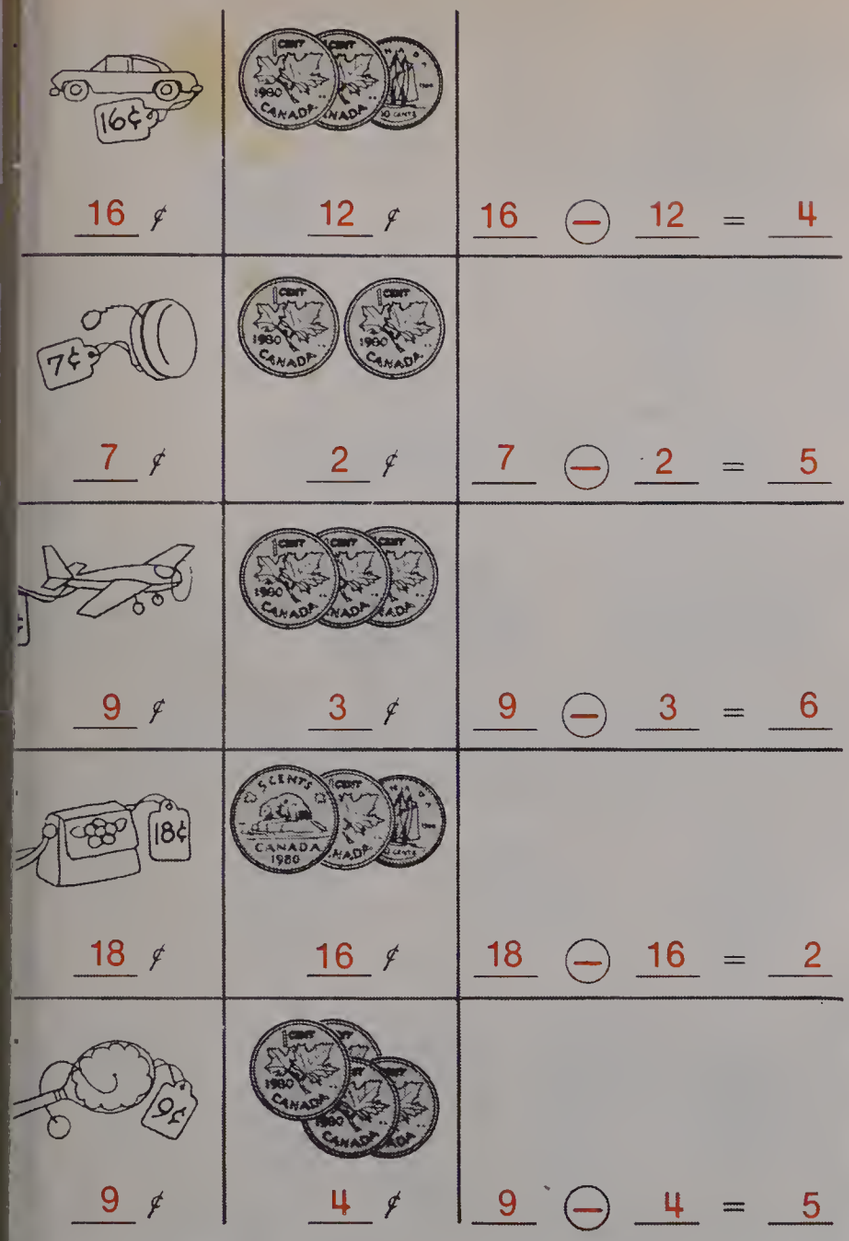
Have the child demonstrate each case to verify the better buy.



Using the Book Panel 1: Tell a story. "Today we are going shopping for toys and goodies. We have some money but not enough. Let's find out how much more we need." Have the child identify the article. (balloon) Ask, "How much does the balloon cost? (8¢)" Have the child trace the 8. Ask, "What coins do we have? (3 pennies) How much are they worth? (3¢)" Have the child trace the 3. Say, "The balloon costs 8¢ and we have 3¢." Ask, "Do we add or subtract to find how many cents are needed? (subtract)" Assist the child in reading and tracing 8 - 3. Then tell the child to find and write the answer. Ask, "How many more cents are needed? (5)" Have the child add 5 cents to 3 cents to check the answer.

Panels 2-5: Adapt the procedure used in panel 1. Assist the child in reading the prices on the tags and in finding the value of coins on the right. Then have the child complete each exercise.

w many more cents are needed?



16 ¢	12 ¢	16 − 12 = 4
7 ¢	2 ¢	7 − 2 = 5
9 ¢	3 ¢	9 − 3 = 6
18 ¢	16 ¢	18 − 16 = 2
9 ¢	4 ¢	9 − 4 = 5

Using the Book Panels 1-5: Tell the child to find how many more cents are needed. For each row, have the child identify the article on the left and write the price shown on the tag. Next, write how many cents the set of coins is worth. Finally, have the child write a subtraction sentence to show how many more cents are needed to buy the article. If necessary, assist the child in completing panel 1.

ACTIVITIES

1. Have the child play Bingo as described in the Activity Reservoir. Fill the cells with amounts of 25 cents or less. Hold up or use a transparency to show combinations of coins (pennies, nickels, dimes). The child covers the appropriate cell for the pictured coins.

2. Let the child work with the play store. For example, show an article that costs 9¢ and give the child 4 pennies. Challenge him or her to show enough additional coins to buy the article. Repeat this activity using other articles with price tags 15¢ and less.

3. Adapt the play store in Activity 2 above. Use articles with price tags 25¢ and less.

4. Have the child select a picture from the worktable which shows an article that costs less than 50¢. Challenge the child to describe the article, tell how much it costs, and show three sets of coins, each worth that much.

5. The child might like to select 2 pictures from the worktable that show articles with price tags more than 20¢. Say, "You have twenty cents. How much more do you need to buy each article?"

OBJECTIVES

To identify a quarter
To know how many cents a quarter is worth
To find how much a set of coins is worth

PACING

Level A	All (1-3 guided)
Level B	All (1-2 guided)
Level C	All (1-2 guided)

VOCABULARY

quarter

MATERIALS

quarters, 25 pennies, 5 nickels, 2 dimes

SUGGESTIONS

Initial Activities 1. Review counting by fives and tens. Introduce the quarter. Elicit the fact that a quarter is worth 25¢.

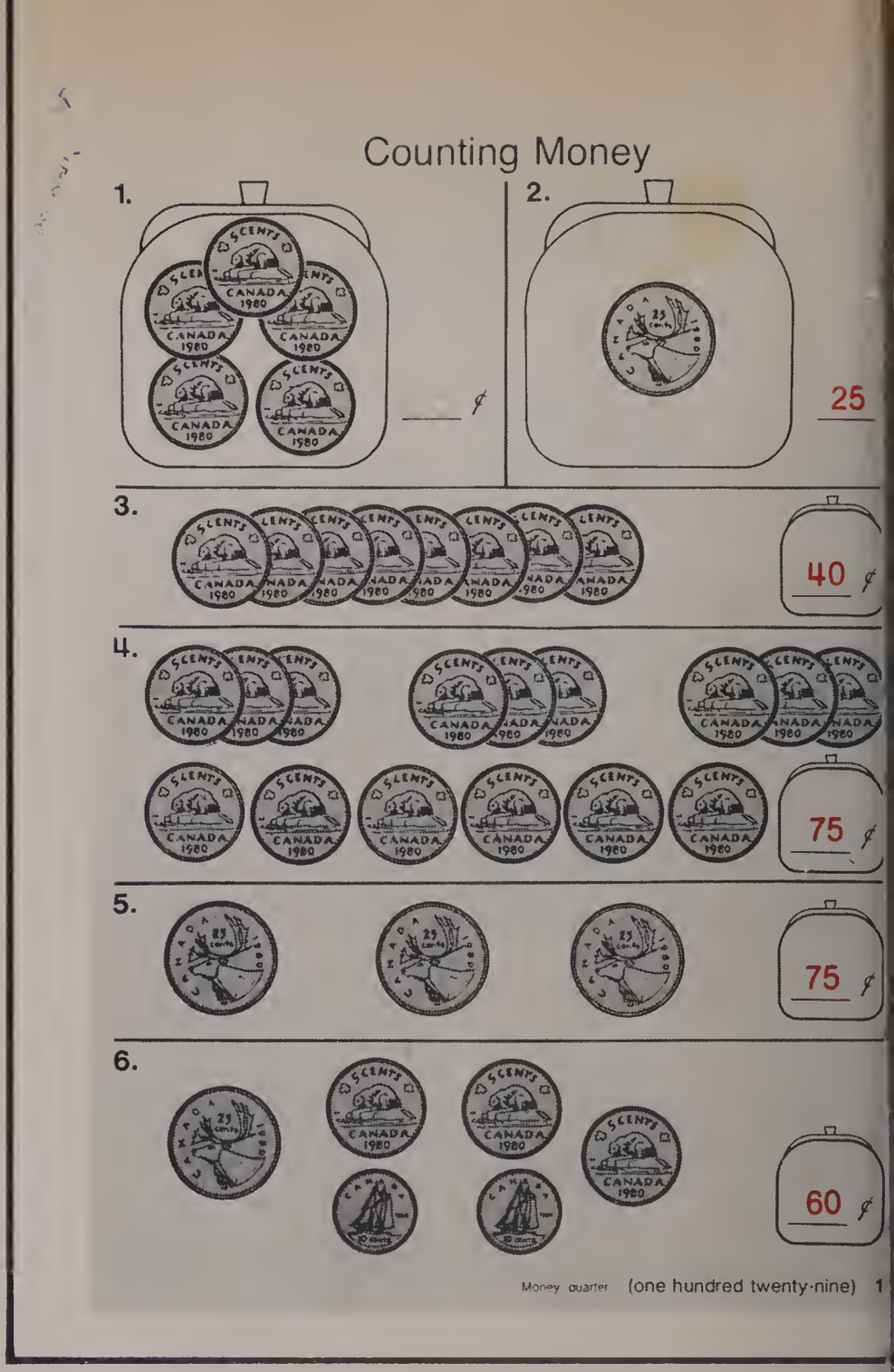
2. Provide pennies, nickels, and dimes. Have the child show various sets of coins that are worth 25¢.

ACTIVITIES

1. Give the child sets of coins, each showing a quarter combined with smaller coins (less than 50¢). Have the child find the value of each set.

2. Have the child continue with Bulletin Board suggestion 2b in the Chapter Overview.

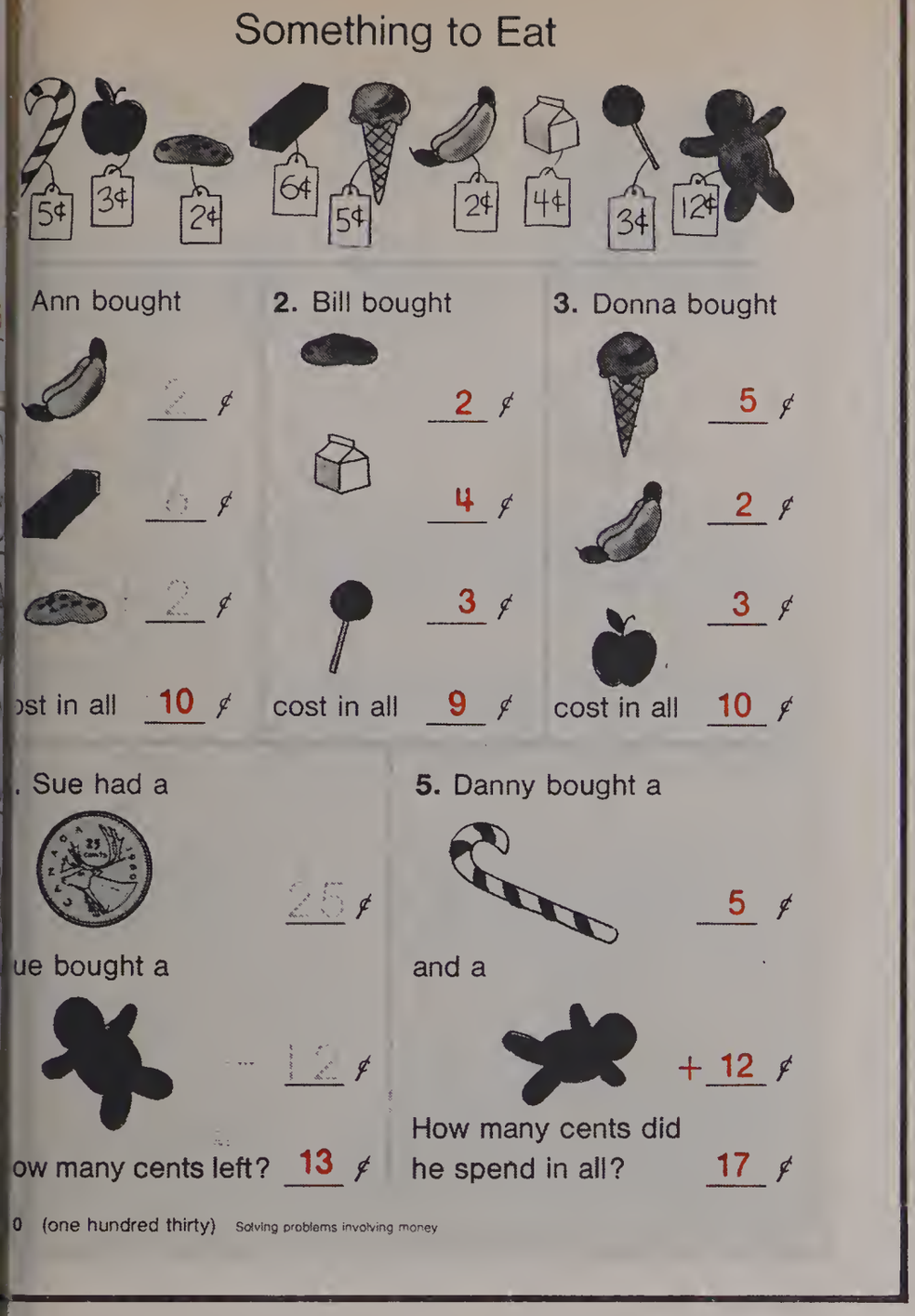
3. Provide the child with sets of coins, each showing a quarter combined with smaller coins (75¢ and less). Have the child find the value of each set.



Using the Book Panel 1: Have the child count by fives to find how much the set of nickels is worth. Ask, "How much is the set of nickels worth? (25¢)" Have the child trace 25.

Panel 2: Have the child identify the coin. Say, "A quarter is worth twenty-five cents." Have the child write 25. Ask, "How many nickels are worth the same as a quarter? (5) How many cents are 5 nickels worth? (25¢) How many cents is a quarter worth? (25¢)"

Panels 3-6: Have the child find the value of the set of coins in each panel



Using the Book Have the child identify each article from left to right and tell how much each article costs.

Panel 1: Have the child trace the numeral to tell how much each article costs. Now add to find the cost in all. Say, "Ann bought a hot dog (or frank), a candy bar, and a cookie." Ask, "How much was the hot dog? (2¢) How much was the candy bar? (6¢) How much was the cookie? (2¢)" Then ask, "How much did Ann's things cost in all? (10¢)"

Panels 2–3: Have the child fill in the blanks and add.

Panels 4–5: For each panel, have the child read the problem. Assist the child in writing the appropriate numeral in each blank. Ask, "Do you add or subtract?" Have the child write the + or – sign and then find the answer.

OBJECTIVE

To solve pictured problems

PACING

Level A	All (guided)
Level B	All (1 and 5 guided)
Level C	All (1 and 5 guided)

MATERIALS

articles with price tags for 2¢, 3¢, 4¢, 5¢, 6¢, 11¢; play money; flannel or magnetic board

SUGGESTIONS

Initial Activities 1. Show articles with price tags for 2¢, 3¢, 4¢, 5¢, and 6¢. Show combinations of three articles (total cost less than 11¢) and have the child find the cost of each set.

2. Set 2 columns on the flannel board. One column should have only objects, the other only price tags with varying amounts. Have the child find their total costs and affix the appropriate flannel numeral.

ACTIVITIES

1. The child might enjoy this game. Fill 5 bags with candy. Label the bags 2¢, 3¢, 4¢, 5¢, and 6¢. The child picks out three bags, adds up the cost, and "pays" for them with play coins.

2. For the worktable, have the child create or make grocery-store or dime-store items and appropriate price tags to hang on the items. Then have the child dramatize problems similar to those in Panels 1-3, page 130.

3. Create problems or posters similar to those in Panels 4 and 5 for the child to solve.

RELATED AIDS

ACT. MASTERS—23.
—Seasonal 8, 9.
BFA PROB. SOLVING I—175-186.

OBJECTIVES

To identify a dollar
To know a dollar is worth 100 cents

PACING

Level A	All (4–5 guided)
Level B	All (1 guided)
Level C	All (1 guided)

VOCABULARY

dollar

MATERIALS

100 pennies, 1 dollar, 20 nickels, 10 dimes, 8 quarters

SUGGESTIONS

Initial Activity Show a dollar bill. Ask the child to identify it. Elicit the idea that it is worth 100 cents.

Develop the ideas that each of the following sets of coins are worth one dollar: (a) 20 nickels; (b) 10 dimes; (c) 4 quarters.

ACTIVITIES

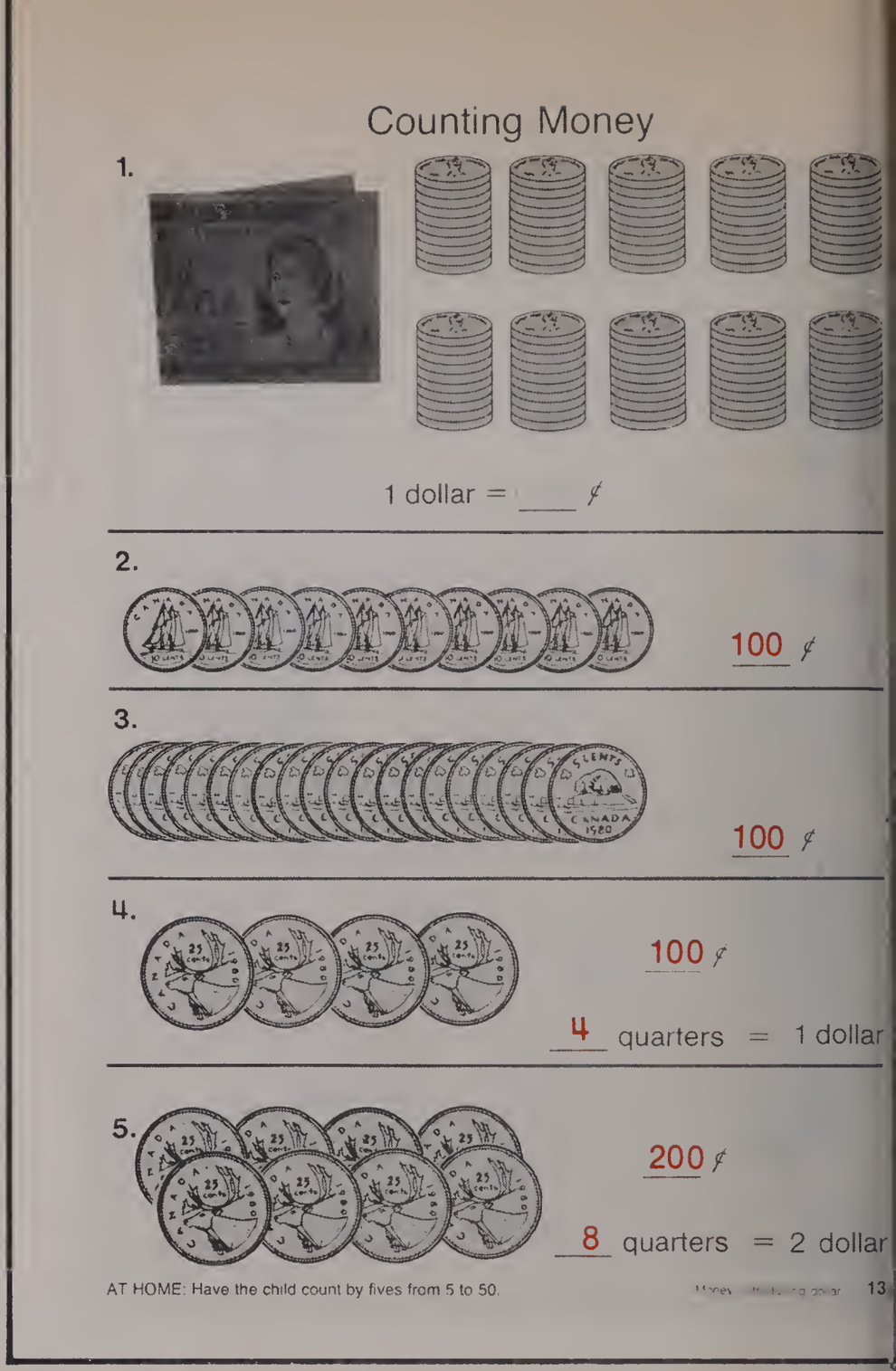
1. Show a dollar bill and two sets of coins worth, say, 78¢ and $1.35. Have the child tell if each set of coins is worth more or less than $1.

2. Have the child play Bingo as described in the Activity Reservoir. Fill cells with amounts of $1.00 or less. Show combinations of coins (pennies, nickels, dimes, quarters, and dollar). The child covers the appropriate cell for the pictured coins.

3. Involve the child in Bulletin Board suggestion 3 in the Chapter Overview. Display around the classroom or on the worktable.

RELATED AIDS

ACT. MASTERS—Seasonal 8.

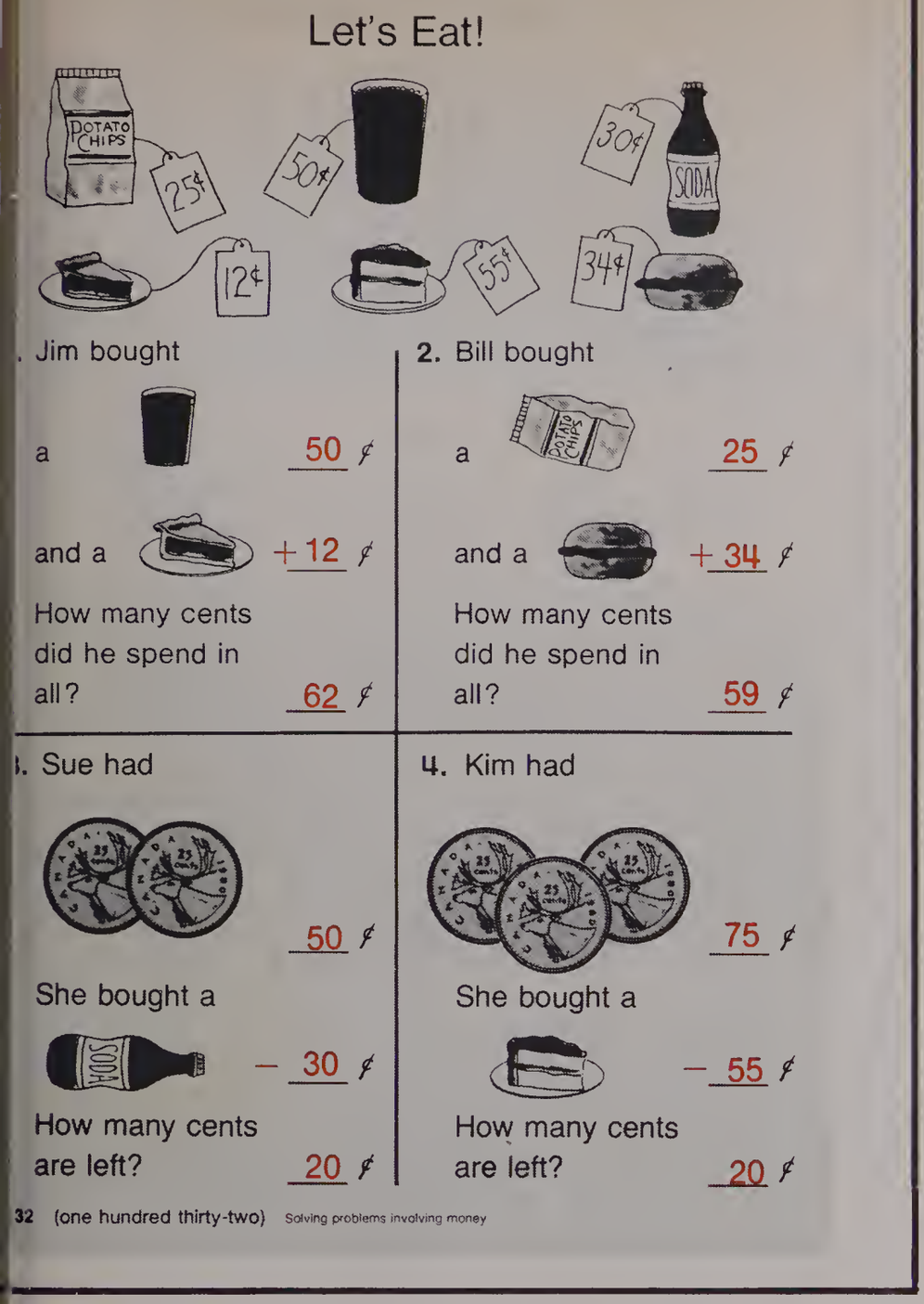


Using the Book Panel 1: Have the child point to the picture of the dollar bill and count the pennies by tens. Ask, "How many cents is the set of pennies worth? (100)" Tell the child that the dollar bill is also worth 100 cents. Have the child trace 100 and read "1 dollar is equal to 100 cents."

Panels 2–5: Have the child find how many cents each set of coins is worth and fill in the blanks.

After the assignment is completed, make certain that the child has the correct answers. Then tell the child to look at the page and answer these questions. Ask, "How many pennies are worth the same as a dollar? (100) How many dimes? (10) How many quarters? (4) How many nickels? (20)"

At Home After finishing the pupil page, the child may take it home and complete the At Home activity printed in blue at the bottom of the page.



Using the Book Have the child identify each article at the top of the page and tell how much it costs.

Panels 1-2: Tell the child that each panel shows a problem. Each boy bought some articles shown at the top of the page. Find how many cents each boy spent in all. Have the child write the cost of each article. Decide whether to add or subtract. Write the + or - sign. Find the answer.

Panels 3-4: Tell the child that each panel shows how much money each girl had. It also shows what each girl bought. Give the value of the coin or coins. Tell how much each article costs. Decide whether to add or subtract. Write + or -. Find the answer. Have the child write how many cents each girl had left.

OBJECTIVE

To solve pictured problems

PACING

Level A	All (guided)
Level B	All (1 guided)
Level C	All (1 guided)

MATERIALS

half-dollar, 5 pennies, 4 dimes, 5 nickels, articles with tags for prices from 10¢ to 50¢

SUGGESTIONS

Initial Activities 1. Select pairs of pictured objects with price tags from 10¢ to 50¢. Have the child find the cost of each pair of articles.

2. Show a quarter, 5 nickels and 2 pennies. Have the child find the value of the set of coins. Show an article priced at 24¢. Ask, "If you buy this article, how many cents will you have left?"

ACTIVITIES

1. Let two children play "store clerk." One child selects two articles from price tags for: 25¢, 12¢, 50¢, 45¢ and 34¢. The other child computes the cost. Children should alternate being the clerk.

2. Create a simplified menu similar to articles at the top of page 158. Give the child a certain amount of coins or play money 75¢ or less. Ask, "What items can you buy for lunch? How much do you have left?"

3. Adapt the luncheon menu from Activity 1 above. Give the child 90¢.

RELATED AIDS

ACT. MASTERS—23.
—Seasonal 8, 9.
BFA PROB. SOLVING I—175-186.

OBJECTIVES

To review and maintain the following skills:

To add, sum ten and less [105]
To add ones to tens and ones [95]
To add tens and ones [97]
To subtract from 10 and less [107]
To subtract ones from tens and ones [100]
To subtract tens and ones [102]

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

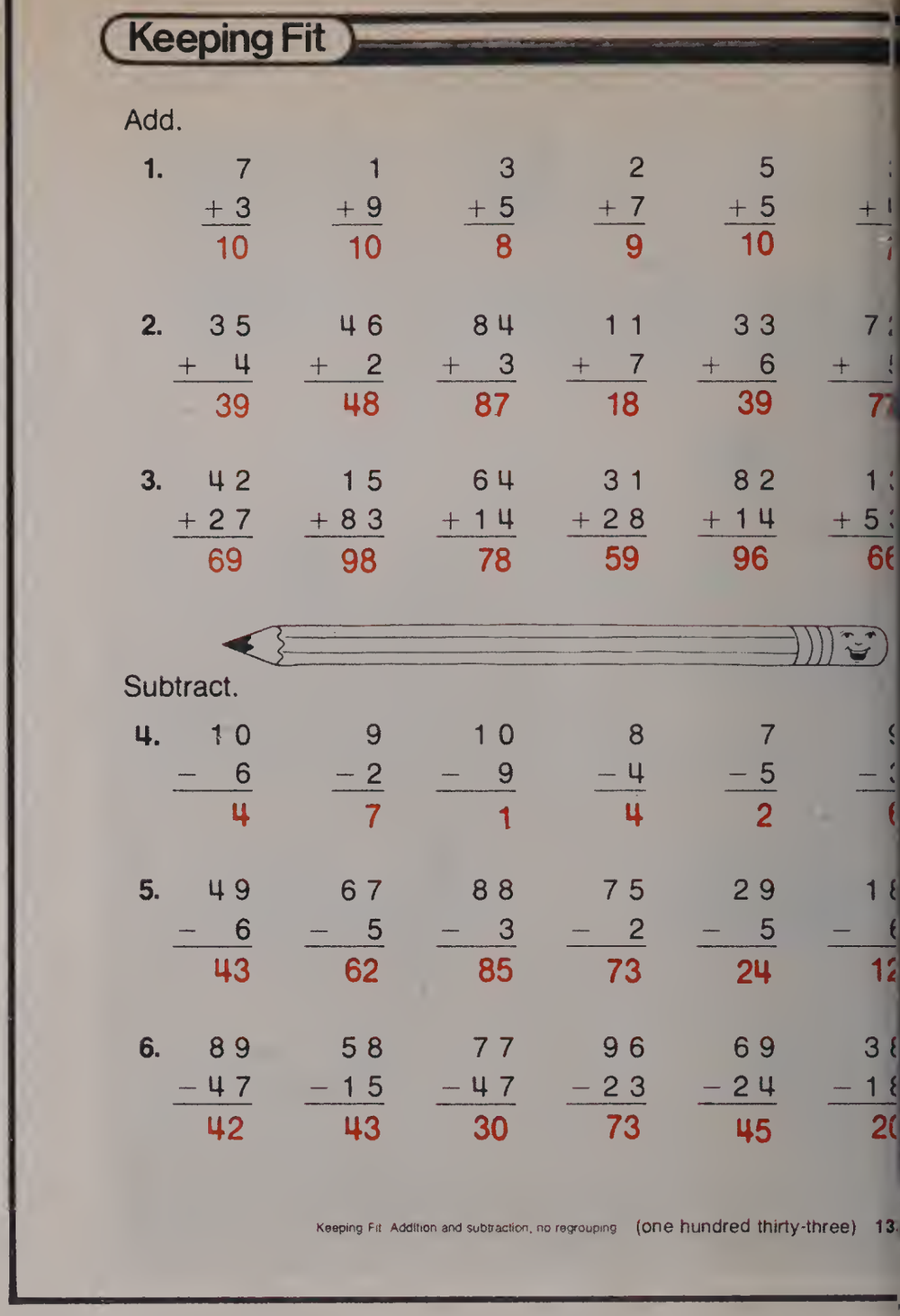
Initial Activity Give the child oral practice on adding and subtracting, sums 10 or less. For example, say, "4 plus 5 (pause), minus 6 (pause), plus 7 (pause), minus 2 (pause), minus 5 (pause), plus 4, what is the answer? (7)"

ACTIVITIES

1. The child may benefit by working, individually, with the basic addition and subtraction practice cards, sums 10 or less.

2. Have the child play Stop the Magician as described in the Activity Reservoir. Use two-digit additions and subtractions.

3. Play the game Bingo described in the Activity Reservoir. Fill cells with addition and subtraction exercises. Have the child cover the cell with an appropriate answer card.



Keeping Fit

Add.

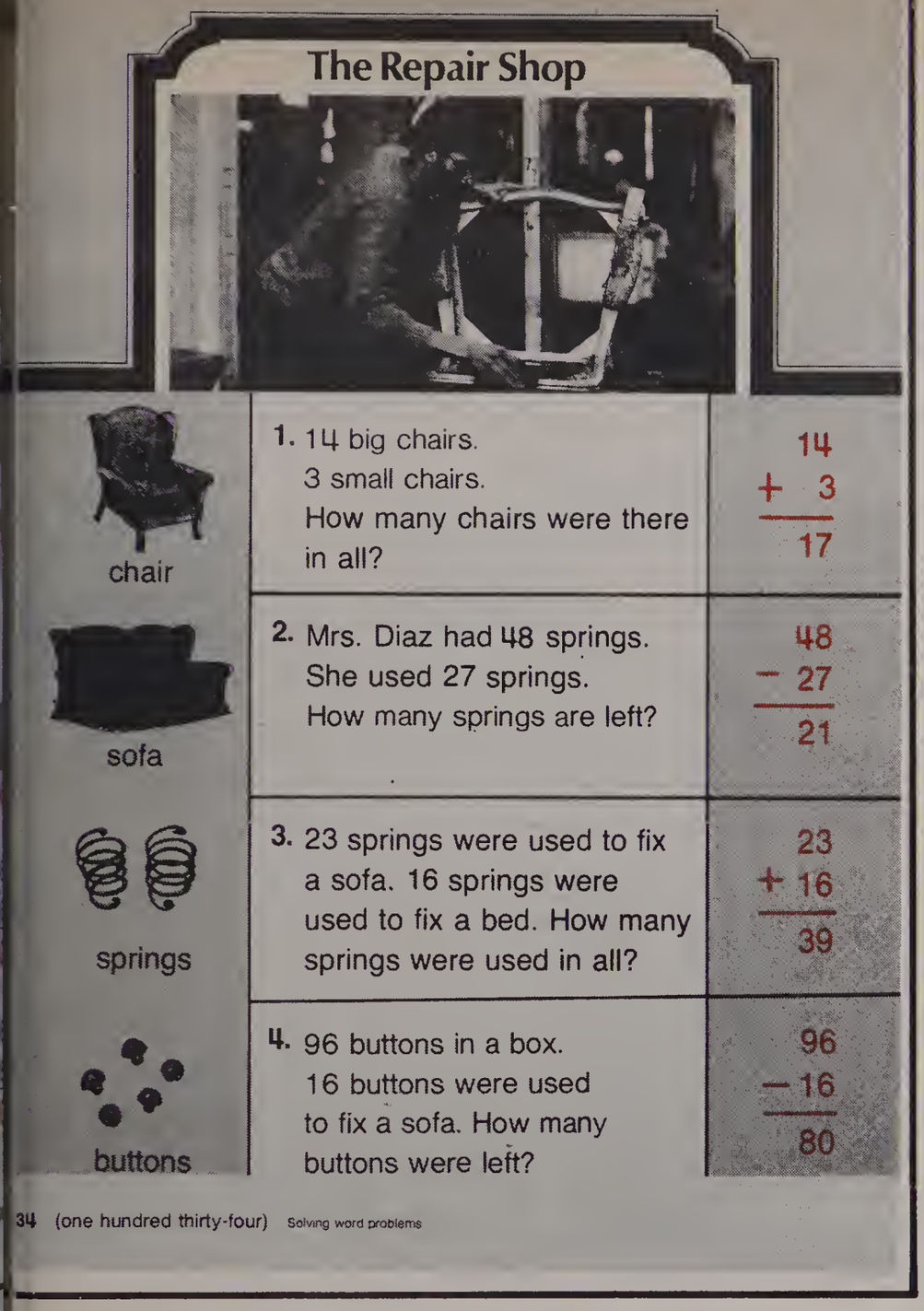
1.	7 + 3 = 10	1 + 9 = 10	3 + 5 = 8	2 + 7 = 9	5 + 5 = 10	+ =
2.	35 + 4 = 39	46 + 2 = 48	84 + 3 = 87	11 + 7 = 18	33 + 6 = 39	+ =
3.	42 + 27 = 69	15 + 83 = 98	64 + 14 = 78	31 + 28 = 59	82 + 14 = 96	+ =

Subtract.

4.	10 − 6 = 4	9 − 2 = 7	10 − 9 = 1	8 − 4 = 4	7 − 5 = 2	− =
5.	49 − 6 = 43	67 − 5 = 62	88 − 3 = 85	75 − 2 = 73	29 − 5 = 24	− =
6.	89 − 47 = 42	58 − 15 = 43	77 − 47 = 30	96 − 23 = 73	69 − 24 = 45	− =

Keeping Fit Addition and subtraction, no regrouping (one hundred thirty-three) 133

Using the Book Panels 1-3: Tell the child to add.
Panels 4-6: Tell the child to subtract.



Using the Book Discuss the picture at the top of the page. (See Career Awareness in the Chapter Overview.) Call attention to the pictures and words in the picture dictionary on the left of the page.

Panel 1: Assist the child in reading the problem. Ask, "Do we add or subtract? (add)" Have the child write the problem in the space at the right and find the sum, 17, that answers the question, "How many in all?" For children having problems, you may want to suggest the use of tally marks for each addend or the counting on strategy in which the child begins with the first addend and counts on. For example, 7 + 3, the child says 7, 8, 9, 10.

Panels 2-4: Have the child read the problem and write an addition or subtraction on the right to find the answer.

OBJECTIVE

To solve word problems

PACING

Level A	All (1-4 guided)
Level B	All (1-2 guided)
Level C	All (1 guided)

MATERIALS

index cards with problems similar to those on page 134

SUGGESTIONS

Initial Activity Select some cards with word problems. Have the child practice reading the problems, telling whether to add or subtract, and answering the question.

The career for this page is furniture upholsterers. Let the child name some furniture and give reasons as to why it might happen to need fixing. Then lead the child to realize that some people fix furniture that we may damage, or furniture that gets old. Ask, "How do furniture upholsterers work with other people? (They fix their furniture.)" See Chapter Overview for more information.

ACTIVITIES

1. Involve the child in making miniature furniture such as tables, chairs, lamps, etc. Use construction paper and paste or clay. Have the child make up a story problem about the play furniture and tell how many in all or how many left.

2. Have the child cut pictures of furniture from newspapers, etc. Group them into sets and write story problems.

3. Challenge the child to draw 5 chairs and tell how many chair legs in all.

OBJECTIVE

To find the sum of three one-digit addends

PACING

Level A All (1-2 guided)
Level B All (1-2 guided)
Level C All (1-2 guided)

MATERIALS

blocks

SUGGESTIONS

Initial Activity Use blocks to dramatize examples like those in Panels 1 and 2. Lead the child to conclude that either way the addends are added, the sum is the same.

ACTIVITIES

1. Give the child ten blocks without letting the child know how many blocks are in the set. Tell the child to separate the set into three parts, give the number of blocks in each, and add to find how many blocks in all.

2. The child might enjoy a card game. Shuffle two packs of numeral cards for 0 through 9. Spread all the cards out on a table. Tell the child, "See how many stacks of three cards you can make so that the sum of the numbers in each stack is 10." Two children may play this game and see which one can make more stacks, so that the sum of the numbers in each stack is 10.

3. Draw a grid with three rows and three cells in each row. Challenge the child to give a number in each cell so that the sum in each row is 10 and the sum in each column is also 10. Here are two solutions: You may wish to give the child some filled-in cells.

3	4	3
2	2	6
5	4	1

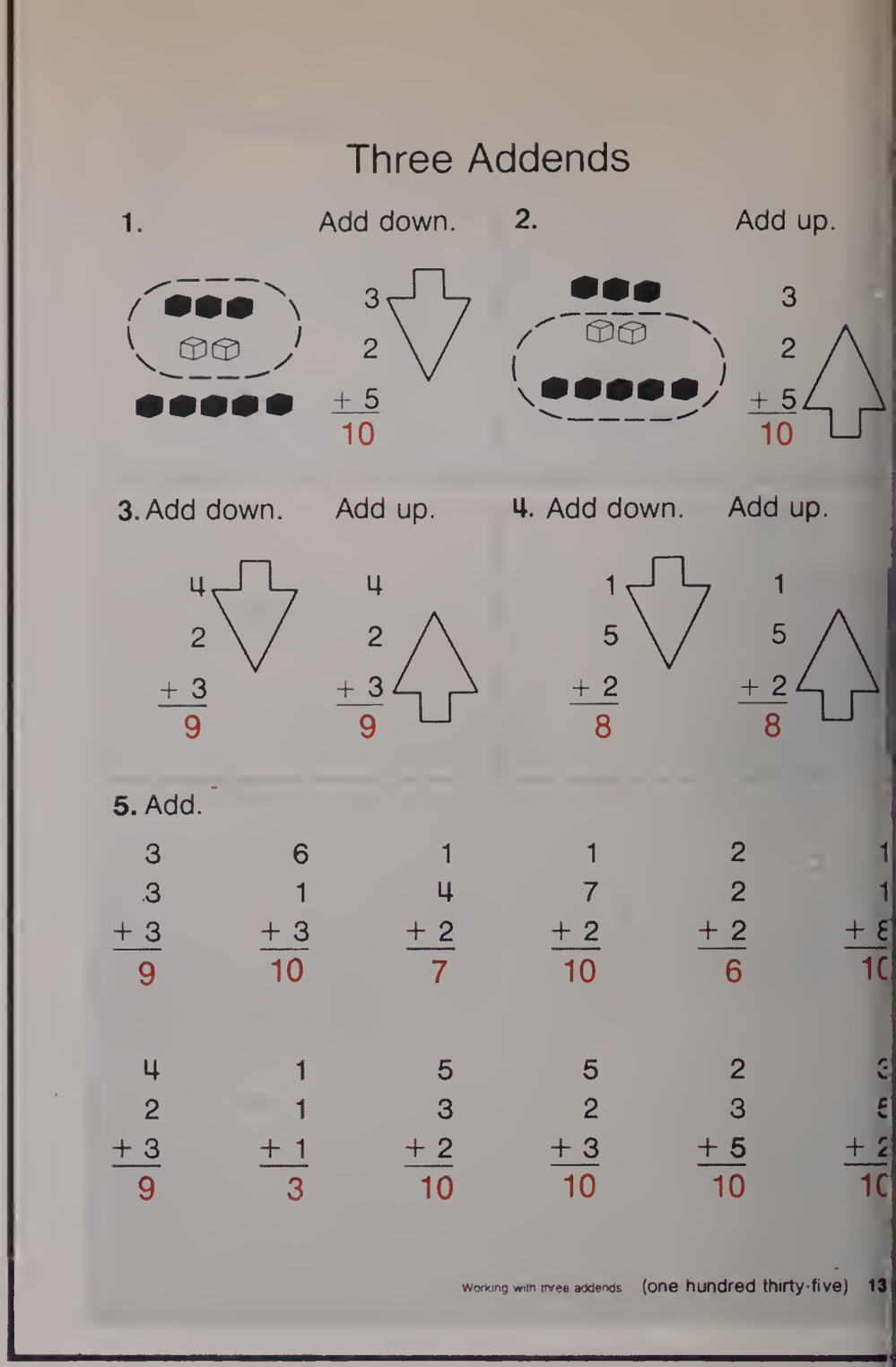
1	3	6
8	1	1
1	6	3

EXTRA PRACTICE

Practice Exercises p. 253 (bottom)

RELATED AIDS

ACT. MASTERS—Gen. Use 5, 6.

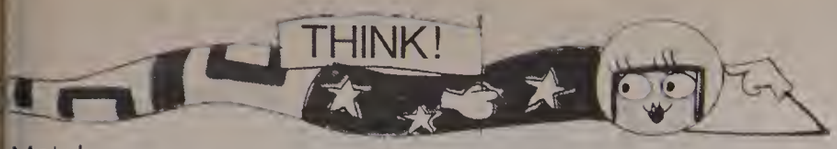


Using the Book Panel 1: Ask, "How many red blocks? (3) How many yellow blocks? (2) How many green blocks? (5)" Tell the child we are going to add the numbers 3, 2, and 5 to find how many blocks in all. Ask, "Which blocks are in the dotted ring? (red and yellow)" Tell the child, "We are going to add 3 and 2 first." Have the child trace 5. Say, "Now add 5 and 5." Ask, "What is the sum? (10)" Have the child write the sum. Say, "How many blocks are there in all? (10)"

Panel 2: Adapt procedures similar to panel 1. After the child completes panel 2, point out each grouping of the addends. Then ask, "Did changing the grouping of the addends change the sum? (no)"

Panels 3-4: Tell the child, for each panel, to add down in the first exercise and add up in the second exercise. After the child completes each panel, point out each grouping of the addends and that the sums are the same.

Panel 5: Have the child add.



Match.

1¢ 50¢ 10¢ 25¢ 5¢

1 dollar

or

100 ¢

3.

100 ¢

Complete. Write > or <.

296 < 401

5. Add.

3		1				
2		6				
+4	9	+3	10			

Write the missing numerals.

___	___	___	179	180	181	182
___	880	___	882	___	884	885
___	___	___	290	295	300	305
___	___	___	690	700	710	720

sing the Book This is a diagnostic test. The page references are given for teaching as needed. The letter indicates the objective.

Panel 1: Have the child match each coin with the tag that shows how uch the coin is worth. [125-130 F]

Panel 2: Tell the child to write the numeral to show how many cents a ollar is worth. [page 131 F]

Panel 3: Have the child write the numeral to show how many cents 10 mes are worth. [page 131 F]

Panel 4: Have the child write > or < in each circle to make true ntences. [pages 121-122 B]

Panel 5: Tell the child to add.

Panel 6: Tell the child, "For each row, find the pattern and write the issing numerals." Remind the child that each hand starts a new sequence. ages 118-120, 123-124 A, C, D, E]

OBJECTIVES

To evaluate achievement of the Chapter Objectives

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

The Chapter Test is designed to be used in a diagnostic manner. It assesses the child's knowledge of the main concepts and skills that were taught in this chapter. Some children should take this test independently with guidance for instructions only. Use judgment as to whether certain children should be guided through some or all of the exercises. Check each child's work and mark the items that are incorrect. Reteaching or extra practice might be necessary to help the child acquire the concept or skill that was missed. With this reteaching, you will be able to ascertain whether the child has then learned the topic in question. See Using the Book for page references indicating where the concept or skill was taught.

ACTIVITIES

1. Have two teams play a relay game called "Tightrope." Prepare two sets of number patterns such as 520 521 522 ___ ___ . . . . Each team member takes turns filling in a blank to walk the tightrope. The first team to complete the sequence correctly wins.

2. Provide play money. Prepare index cards with a picture of an article and a price less than 50 cents. For each card, the child shows a set of coins worth as much as the article costs. Challenge the child to find how many different types of coins may be used to make a desired amount.

CHAPTER 8 OVERVIEW

Addition and subtraction facts, sums 11-14, are introduced. Sentences such as $12 - 8 \bigcirc 3 + 4$, in which $>$, $<$, or $=$ is written to make a true sentence, provide practice on basic facts, sums 14 or less. Checking additions and subtractions (involving two-digit numerals) is also introduced in this chapter.

The art theme for this chapter is "Music."

OBJECTIVES

A To add, sums 11 through 14
B To subtract, sums 11 through 14
C To complete related addition and subtraction sentences, sums 14 or less
D To solve word problems

VOCABULARY

check 152

BACKGROUND

The child may find the sum of 3 and 4 by counting objects such as fingers or blocks. That is, the child may make a set of 3 and a set of 4, then combine the sets and count all the objects. However, when sums are greater than ten such as $8 + 6$, it is time consuming to resort to forming a set of 8 and a set of 6, then counting all the objects. The child should develop an understanding of the method of making a ten to find the sum and also develop the skill of making a ten to find the sum.

MATERIALS

18 blocks
addition and subtraction practice cards for sums 10 through 14 (in vertical form)
word problems on file cards
a card for each sign >, <, and =
articles with price tags for 6¢, 7¢, and 8¢
play money

CAREER AWARENESS

Musicians [147]

Professional musicians have had many years of practice and study. Often musicians specialize in popular or classical music. These musicians might play in symphony orchestras or dance bands. There are also many rock or jazz groups. Some instruments played are the trumpet, trombone, clarinet, saxophone, organ, piano, string bass, drums, and guitar. Many musicians teach music in schools or give private lessons.

It is important that children develop an awareness of self and others. Children should realize that musicians play for their own and others' enjoyment. They work at playing music that is pleasing to the ear. Most musicians perform before an audience. The audience should be courteous in receiving these performers.

Photo description: These classical musicians are rehearsing for a concert on a trumpet and a xylophone. They will perform with an orchestra. The tools on the wall are used by a violin maker.

BULLETIN BOARD

1. The children might enjoy pretending they are inventors. Encourage them to invent their own addition and subtraction computer. Remind the children that the computer must have a place for the input, the output, and the rule. Assist the children in building their computer to be displayed on the bulletin board. Supply the children with numeral cards for 0 through 14 and challenge them to practice addition and subtraction facts using their computer.

2.a. You might draw a large picture of the children's favorite musical instrument, such as a tuba. Show large musical notes coming out of the instrument with vertical addition and subtraction facts (sum 11). You might also have a pocket on the instrument with mini-problems involving sums 11 and 12 in them. Challenge the child to answer all the examples on the musical notes. Then choose a problem from the pocket to solve and draw an appropriate picture to display.

b. Extend this suggestion by including sums and differences through 14.

3. Direct the children in making a poster of a large building with 5 floors. The floors are numbered 10 to 14 from bottom to top. On each window on each floor, the children write an addition whose sum is the number of that floor. For example, 8 + 6 is written on a window on the 14th floor.

OBJECTIVES

To add, sums 11 and 12, using vertical form

To show the order property of addition

PACING

Level A	137 All (1-4 guided) 138 All
Level B	137 All (1-2 guided) 138 All
Level C	137 All (1-2 guided) 138 All

MATERIALS

addition practice cards for sums 10, 11, and 12, showing the vertical form

SUGGESTIONS

Initial Activities 1. Shuffle the addition practice cards for sums 11 and 12 (vertical form). Arrange them in random order on a table or chalkrail. Have the child select pairs of addition exercises that show the order property of addition.

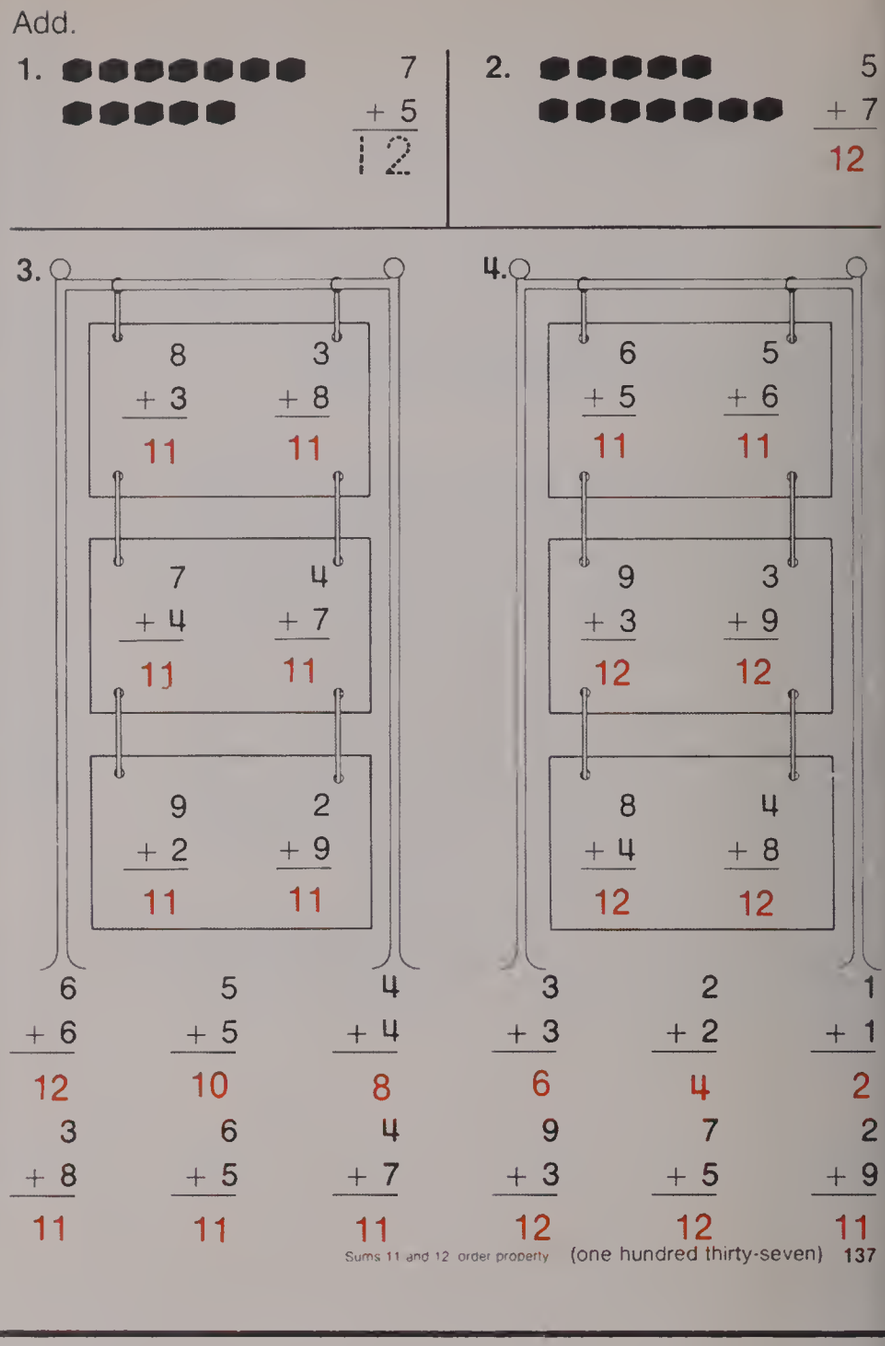
2. Shuffle the addition practice cards (vertical form) for sums 10, 11, and 12. Show the cards one at a time and have the child give the sum as quickly as possible, then change the order of the addends.

EXTRA PRACTICE

Tell the child to add.

1.	9 +3	6 +4	2 +5	8 +3	5 +7
2.	2 +8	3 +7	6 +5	7 +4	6 +6
3.	4 +0	11 + 1	10 + 2	8 +4	0 +9
4.	7 +5	8 +1	1 +11	2 +9	10 + 0
5.	0 +0	4 +4	3 +3	2 +2	5 +5

Sums Eleven and Twelve



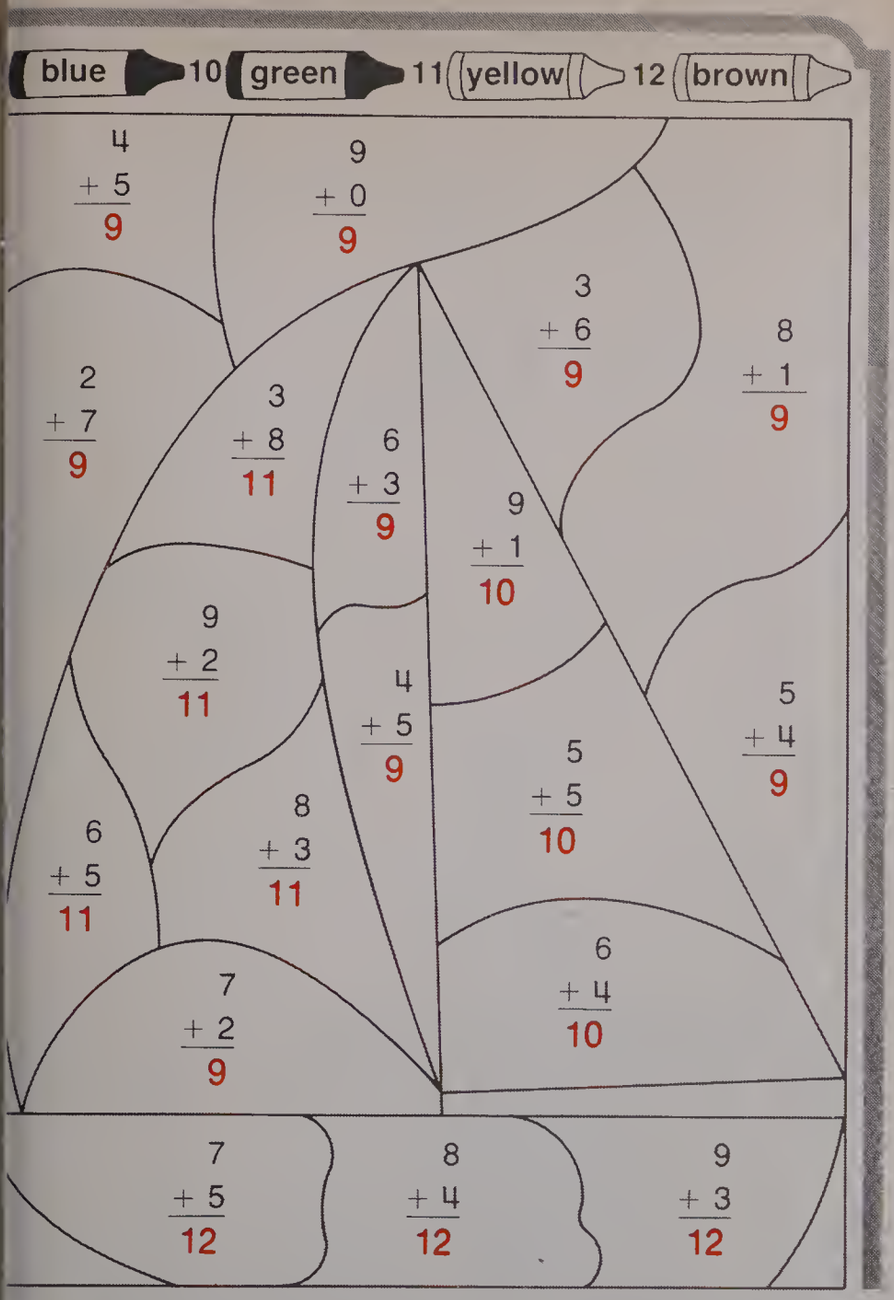
Sums 11 and 12 order property (one hundred thirty-seven) 137

Using the Book Panels 1-2: For panel 1, ask, "How many blue blocks are there? (7) How many red blocks? (5) How many blocks in all? (12) Seven plus 5 is what number? (12)" Tell the child to write the sum. For panel 2, adapt the procedures for panel 1. When the child has written the sum ask, "Are the addends the same in panels 1 and 2? (yes) Did changing the order of the addends change the sum? (no)"

Panels 3-4: Tell the child to write the sums for each pair of exercises.

Panel 5: Tell the child to write the sums. When the child has completed these additions ask, "Each first addend is how much less than the preceding first addend? (1) Each second addend is how much less than the preceding second addend? (1) Each sum is how much less than the preceding sum? (2)"

Panel 6: Tell the child to write the sums.



Using the Book Have the child read the numerals and name the colors at the top of the page. Ask, "What color goes with 11? (yellow) With 9? (blue)"

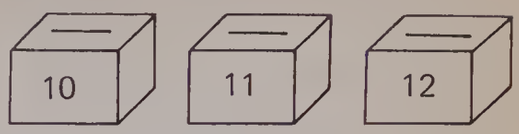
For this activity, tell the child that the page is divided into parts. Each part is to be colored. For each part, find the sum and look at the top of the page for that sum. Color the part with the color that goes with that sum. For example, in the upper left-hand corner, the sum is 9 so that part is colored blue.

When the picture is completed, ask the child to describe the picture.

At Home Upon completion of the pupil page, the child may take the page home and do the At Home activity suggested at the bottom of the page.

ACTIVITIES

1. Prepare boxes that can be referred to as mailboxes.



Shuffle the addition practice cards, vertical form, for sums 10, 11, and 12. Give the cards to the child. Say, "Pretend you are a mail carrier and these are letters for you to deliver. See if you can put them in the correct boxes."

2. Have the child play Three-in-a-Row Bingo. Prepare cards with nine 70 cm x 70 cm squares. Write numerals 12 or less in each square. No two cards should have the same numerals in the same positions. Use paper discs, paper clips, etc. for markers. Call a problem such as 4 + 2. The child with 6 on a card puts a marker on that numeral. Continue in this manner until a child has 3 markers in a row.
Sample boards:

7	10	4
8	3	9
2	6	5

12	7	10
8	9	4
6	5	11

3. Tell the child, "I will read some addition exercises. If the sum is greater than 10, thumbs up. If the sum is 10, hold up 10 fingers. If the sum is less than 10, thumbs down." Then read some addition exercises for sums 8, 9, 10, 11, and 12 and see how the child reacts.

RELATED AIDS

ACT. MASTERS—18, 24, 25.
—Gen. Use 2, 7, 9, 13.
BFA COMP LAB I—8, 9, 15.
BFA PROB. SOLVING I—61, 66.

OBJECTIVES

To add, sums 13 and 14, using vertical form

To show the order property of addition

PACING

Level A	All (1-3 guided)
Level B	All (1-3 guided)
Level C	All (1-2 guided)

MATERIALS

Addition practice cards (vertical form) for sums 13 and 14, 8 red blocks, 6 yellow blocks

SUGGESTIONS

Initial Activities 1. Show a set of 8 blocks and a set of 5 blocks. Ask the child to tell how many in all. Then switch the order of showing the blocks. Show 5 blocks, then show 8 blocks. Ask, "How many blocks in all? (13)" Write:

$$\begin{array}{r} 8 \\ +5 \\ \hline \end{array} \qquad \begin{array}{r} 5 \\ +8 \\ \hline \end{array}$$

Have the child write the sum for each addition. Ask, "Did changing the order of the addends change the sum? (no)"

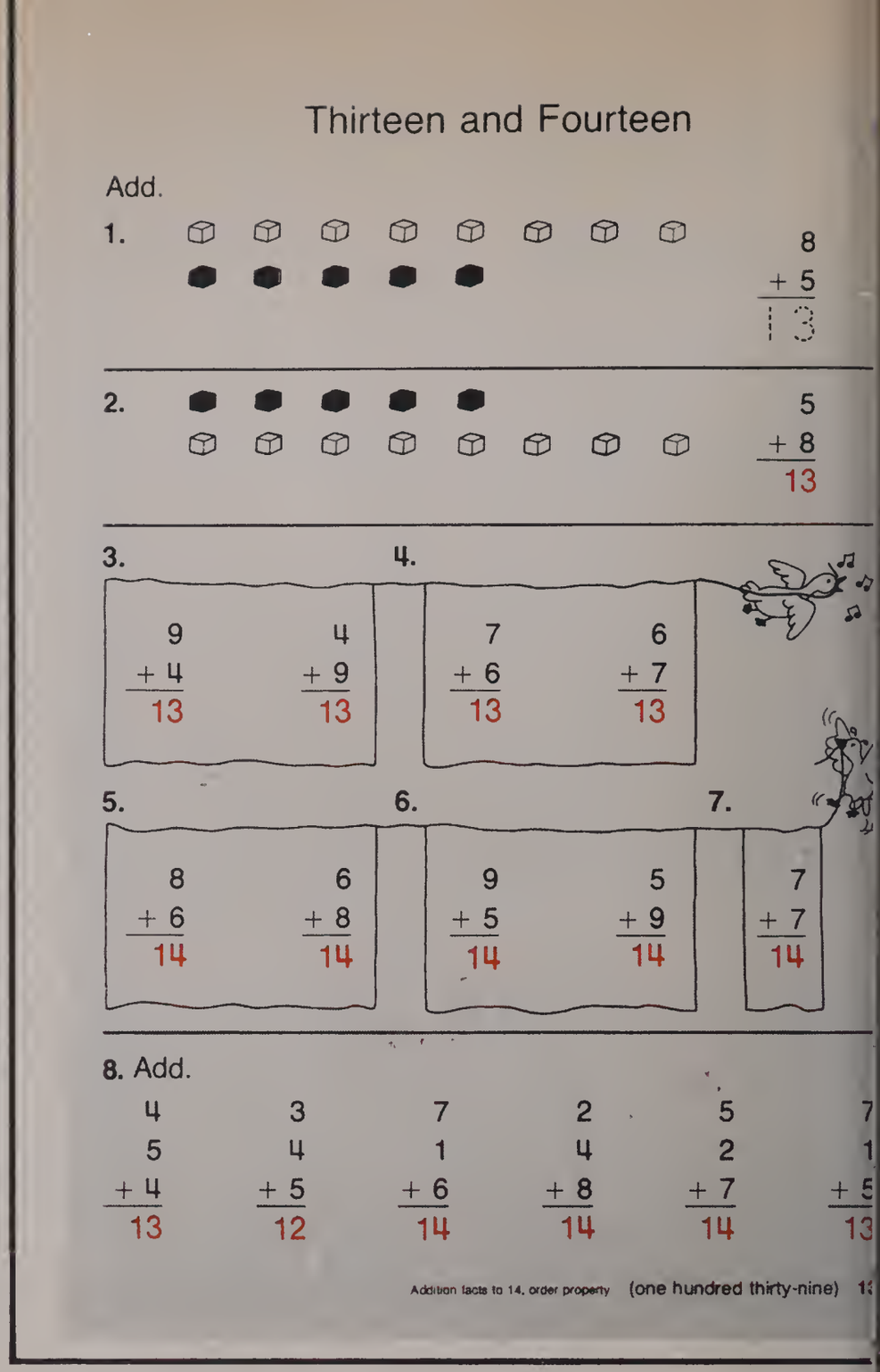
2. Repeat this activity using addition practice cards.

ACTIVITIES

1. Let the child use Basic Fact Practice Cards described in the Activity Reservoir.

2. Two children may play the game Match My Sum. Each child has a stack of addition cards for sums 13 and 14. One child holds up a card, say 6 + 8, saying, Match My Sum. The other child selects a card showing the same sum but having different order.

3. Give the child two sets of numeral cards for 1 through 9. Have the child pair the cards that show sum 13. Repeat the activity for sum 14.



Using the Book Panel 1: Ask, "How many yellow blocks are there? (8) How many blue blocks? (5) How many blocks in all? (13) Eight plus 5 is what number? (13)" Have the child give the sum.

Panel 2: Adapt the procedures for panel 1. When the child has given the sum, ask, "Are the addends the same in panels 1 and 2? (yes) Did changing the order of adding change the sum? (no)"

Panels 3-7: Tell the child to add. Ask, "Why is there only one exercise in panel 7?" (The addends are the same.)

Panel 8: Tell the child to add.

dd.

6 + 7 = 13	4 + 8 = 12	9 + 5 = 14	7 + 5 = 12	8 + 3 = 11	6 + 8 = 14
3 + 9 = 12	7 + 7 = 14	2 + 9 = 11	4 + 9 = 13	7 + 4 = 11	8 + 5 = 13
6 + 6 = 12	5 + 8 = 13	9 + 4 = 13	8 + 6 = 14	5 + 9 = 14	6 + 7 = 13
5 + 6 = 11	6 + 4 = 10	0 + 9 = 9	3 + 7 = 10	5 + 4 = 9	8 + 2 = 10
7 + 6 = 13	6 + 3 = 9	7 + 7 = 14		1 + 8 = 9	5 + 9 = 14
5 + 7 = 12	9 + 4 = 13	3 + 8 = 11		8 + 4 = 12	8 + 6 = 14
5 + 8 = 13	9 + 3 = 12	4 + 7 = 11		9 + 2 = 11	3 + 2 = 5
5 + 3 = 8	2 + 6 = 8	3 + 4 = 7		2 + 4 = 6	6 + 5 = 11

Using the Book Panels 1-8: Tell the child to add.

4. Two children may play the game Match My Sum. Each child has a stack of addition cards for sums 13 and 14. One child holds up a card, say 6 + 8, saying, Match My Sum. The other child selects a card showing the same sum but having a different order.

5. Use Bulletin Board Suggestion 3 in the Chapter Overview.

6. Draw a beanstalk on the board. Place leaves randomly from bottom to top. On each leaf write a vertical addition for sums 13 and 14. Challenge the child to see how high he/she can climb.

7. Give the child two sets of numeral cards for 1 through 9. Have the child pair all the cards that will have sum 13 or 14.

8. Using the numeral cards above, you might challenge the child to group cards in sets of three to show sums 13 or 14.

EXTRA PRACTICE

Tell the child to add.

1.	5 +6 = 11	7 +7 = 14	8 +4 = 12	6 +4 = 10	5 +8 = 13
2.	6 +7 = 13	3 +9 = 12	8 +6 = 14	4 +9 = 13	9 +2 = 11
3.	3 +8 = 11	5 +9 = 14	2 +7 = 9	4 +7 = 11	4 +8 = 12
4.	6 +8 = 14	3 +7 = 10	7 +6 = 13	4 +5 = 9	8 +5 = 13
5.	6 +5 = 11	2 +8 = 10	9 +0 = 9	4 +4 = 8	7 +5 = 12

RELATED AIDS

ACT. MASTERS—18, 24, 25.
—Gen. Use 2, 7, 9, 13.
BFA COMP LAB I—8, 9, 15.
BFA PROB. SOLVING I—61, 66.

OBJECTIVES

To add and subtract tens and ones, no regrouping

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

Initial Activity You might display a set of tens and ones–blocks. Have the child add or take away different sets of blocks as instructed. Relate each addition and subtraction to the activity. Stress that we start with the ones first in both addition and subtraction. Use a place value chart to emphasize the number of tens and ones for each numeral.

Add

Tens	Ones
6	3
2	4
8	7

$$\begin{array}{r} 63 \\ +24 \\ \hline 87 \end{array}$$

ACTIVITIES

1. Adapt the game Stop the Magician described in the Activity Reservoir. Give the children addition and subtraction problems involving tens and ones. You may want to have the children work in pairs to solve the problems. Provide blocks, if needed, to help the children find the sums and differences.

2. The child may enjoy verifying some of the answers on this page with a mini-calculator.

3. Play Flash Card Sports as described in the Activity Reservoir.

EXTRA PRACTICE

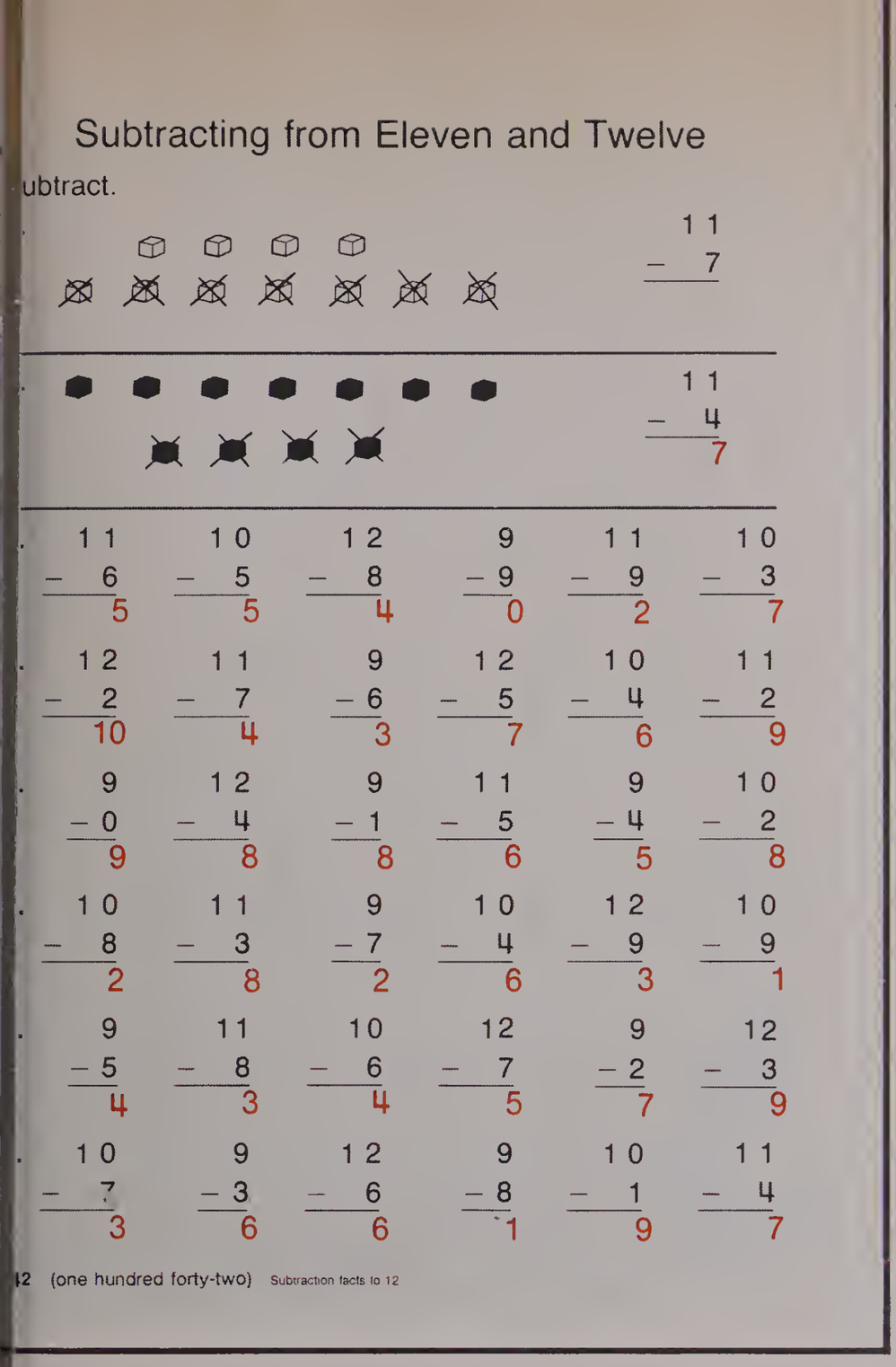
Tell the child to add or subtract.

1.	$\begin{array}{r} 35 \\ +\ 2 \\ \hline \end{array}$	$\begin{array}{r} 43 \\ +\ 4 \\ \hline \end{array}$	$\begin{array}{r} 30 \\ +\ 9 \\ \hline \end{array}$	$\begin{array}{r} 72 \\ +\ 7 \\ \hline \end{array}$	$\begin{array}{r} 61 \\ +\ 8 \\ \hline \end{array}$
2.	$\begin{array}{r} 78 \\ +20 \\ \hline \end{array}$	$\begin{array}{r} 57 \\ +42 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ +14 \\ \hline \end{array}$	$\begin{array}{r} 65 \\ +11 \\ \hline \end{array}$	$\begin{array}{r} 31 \\ +57 \\ \hline \end{array}$
3.	$\begin{array}{r} 98 \\ -\ 7 \\ \hline \end{array}$	$\begin{array}{r} 56 \\ -\ 5 \\ \hline \end{array}$	$\begin{array}{r} 49 \\ -\ 6 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ -\ 4 \\ \hline \end{array}$	$\begin{array}{r} 55 \\ -\ 1 \\ \hline \end{array}$
4.	$\begin{array}{r} 38 \\ -22 \\ \hline \end{array}$	$\begin{array}{r} 86 \\ -40 \\ \hline \end{array}$	$\begin{array}{r} 54 \\ -44 \\ \hline \end{array}$	$\begin{array}{r} 69 \\ -36 \\ \hline \end{array}$	$\begin{array}{r} 75 \\ -55 \\ \hline \end{array}$

Add or subtract.

$\begin{array}{r} 42 \\ +\ 2 \\ \hline 44 \end{array}$	$\begin{array}{r} 30 \\ +\ 5 \\ \hline 35 \end{array}$	$\begin{array}{r} 56 \\ +\ 3 \\ \hline 59 \end{array}$	$\begin{array}{r} 63 \\ +\ 5 \\ \hline 68 \end{array}$	$\begin{array}{r} 94 \\ +\ 5 \\ \hline 99 \end{array}$
$\begin{array}{r} 99 \\ -\ 6 \\ \hline 93 \end{array}$	$\begin{array}{r} 58 \\ -\ 3 \\ \hline 55 \end{array}$	$\begin{array}{r} 26 \\ -\ 5 \\ \hline 21 \end{array}$	$\begin{array}{r} 19 \\ -\ 6 \\ \hline 13 \end{array}$	$\begin{array}{r} 75 \\ -\ 2 \\ \hline 73 \end{array}$
$\begin{array}{r} 38 \\ +60 \\ \hline 98 \end{array}$	$\begin{array}{r} 40 \\ +19 \\ \hline 59 \end{array}$	$\begin{array}{r} 67 \\ +32 \\ \hline 99 \end{array}$	$\begin{array}{r} 52 \\ +21 \\ \hline 73 \end{array}$	$\begin{array}{r} 30 \\ +60 \\ \hline 90 \end{array}$
$\begin{array}{r} 80 \\ -30 \\ \hline 50 \end{array}$	$\begin{array}{r} 78 \\ -26 \\ \hline 52 \end{array}$	$\begin{array}{r} 75 \\ -40 \\ \hline 35 \end{array}$	$\begin{array}{r} 37 \\ -26 \\ \hline 11 \end{array}$	$\begin{array}{r} 97 \\ -27 \\ \hline 70 \end{array}$
$\begin{array}{r} 50 \\ +\ 7 \\ \hline 57 \end{array}$	$\begin{array}{r} 48 \\ -24 \\ \hline 24 \end{array}$	$\begin{array}{r} 84 \\ -\ 4 \\ \hline 80 \end{array}$	$\begin{array}{r} 79 \\ -58 \\ \hline 21 \end{array}$	$\begin{array}{r} 37 \\ +42 \\ \hline 79 \end{array}$

Using the Book Panels 1-5: Tell the child to add or subtract.



Subtracting from Eleven and Twelve

ubtract.

11 − 7

11 − 4 = 7

11 − 6 = 5	10 − 5 = 5	12 − 8 = 4	9 − 9 = 0	11 − 9 = 2	10 − 3 = 7
12 − 2 = 10	11 − 7 = 4	9 − 6 = 3	12 − 5 = 7	10 − 4 = 6	11 − 2 = 9
9 − 0 = 9	12 − 4 = 8	9 − 1 = 8	11 − 5 = 6	9 − 4 = 5	10 − 2 = 8
10 − 8 = 2	11 − 3 = 8	9 − 7 = 2	10 − 4 = 6	12 − 9 = 3	10 − 9 = 1
9 − 5 = 4	11 − 8 = 3	10 − 6 = 4	12 − 7 = 5	9 − 2 = 7	12 − 3 = 9
10 − 7 = 3	9 − 3 = 6	12 − 6 = 6	9 − 8 = 1	10 − 1 = 9	11 − 4 = 7

12 (one hundred forty-two) Subtraction facts to 12

Using the Book Panel 1: Ask, "How many yellow blocks are there? (11)" Have the child trace the X's to show subtraction. Ask, "How many blocks have X's on them? (7) How many blocks are left? (4) Eleven minus 7 is what number?" Have the child trace 4.

Panel 2: Ask, "How many blue blocks are there? (11) How many blocks have X's on them? (4)" Ask, "How many blocks are left? (7) Eleven minus 4 is what number?" Have the child write 7 in the space on the right.

Panels 3-8: Tell the child to subtract.

OBJECTIVE

To subtract from 12 and less

PACING

Level A	All (1-3 guided)
Level B	All (1-2 guided)
Level C	All (1-2 guided)

MATERIALS

12 blocks, subtraction practice cards (vertical form) for sums 11 and 12

SUGGESTIONS

Initial Activities 1. Show a set of 11 blocks. Have the child remove 9 blocks. Ask, "How many are left? (2)" Develop the vertical subtraction 11 - 9 = 2 using the blocks. Next, have the child remove 2 blocks from the set of 11. Develop the vertical subtraction 11 - 2 = 9.

2. Develop other subtraction facts for sums 11 and 12 using the procedures above.

3. Use the subtraction practice cards for sums 11 and 12. Show the cards one at a time and have the child give the difference.

ACTIVITIES

1. Give each of two children 12 blocks. Children take turns. One child creates subtraction problems (for example, show 12 blocks, take away 8). The second child writes the vertical subtraction fact and gives the difference.

2. The children may enjoy drawing a picture demonstrating subtracting from 11 and 12. For example, 8 birds eating, 3 birds flying away demonstrating 11 minus 3 equals 8. Have the children color the pictures and then display them around the room.

RELATED AIDS

ACT. MASTERS—18, 20.
—Seasonal 3, 4.
—Gen. Use 10, 11, 13.
BFA COMP LAB I—46, 47.
BFA PROB. SOLVING I—62, 65, 66.

OBJECTIVE

To subtract from 14 and less

PACING

Level A	143 All (1-3 guided) 144 All
Level B	143 All (1-2 guided) 144 All
Level C	143 All (1-2 guided) 144 All

MATERIALS

14 blocks, subtraction practice cards (vertical form) for sums 13 and 14

SUGGESTIONS

Initial Activities 1. Show a set of 13 blocks. Have the child remove 4. Ask, "How many are left? (9)" Have the child count the blocks to verify. Develop the vertical subtraction 13 - 4 = 9 and relate it to the blocks. Next, have the child remove 9 blocks from the 13. Write the vertical subtraction 13 - 9 = 4, and relate it to the blocks.

2. Develop other subtraction facts for sums 13 and 14, by adapting the procedures above.

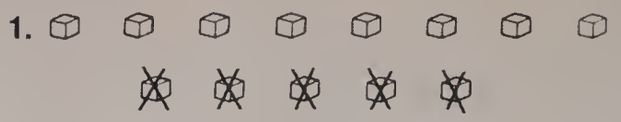
3. Use the subtraction practice cards for sums 13 and 14. Show each card and have the child give the difference.

ACTIVITIES

1. Play the subtraction game, Take Away, with a group of children, Provide each child with a pile of 20 small objects, such as buttons. Say, "14." The child counts out 14 buttons from his or her pile. Then say, "Take away 8!" Children are to say the answer and check by taking away 8 buttons.

Subtracting from Thirteen and Fourteen

Subtract.



1. 13 − 5

2. 13 − 8 = 5

3.	14 − 5 = 9	13 − 7 = 6	11 − 6 = 5	14 − 7 = 7	10 − 9 = 1	1 − =
4.	12 − 6 = 6	10 − 3 = 7	14 − 9 = 5	10 − 1 = 9	11 − 7 = 4	1 − =
5.	11 − 2 = 9	12 − 5 = 7	10 − 4 = 6	13 − 9 = 4	10 − 7 = 3	1 − =
6.	11 − 5 = 6	13 − 6 = 7	10 − 5 = 5	12 − 8 = 4	11 − 3 = 8	1 − =
7.	13 − 4 = 9	12 − 3 = 9	13 − 8 = 5	11 − 9 = 2	10 − 6 = 4	1 − =
8.	11 − 4 = 7	14 − 6 = 8	10 − 8 = 2	12 − 4 = 8	13 − 5 = 8	1 − =

Using the Book Panel 1: Ask, "How many yellow blocks are there? (13) How many are being taken away? (5)" Have the child trace the X's to show the subtraction. Ask, "How many blocks are left? (8) Thirteen minus 5 is what number?" Have the child trace 8.

Panel 2: Follow procedures similar to those for panel 1. Elicit that these are related subtraction facts since both subtractions use the same numbers; 13, 5, and 8.

Panels 3-8: Have the child subtract.

ubtract.

13 − 5 = 8	12 − 6 = 6	14 − 7 = 7	10 − 9 = 1	11 − 5 = 6	14 − 9 = 5
11 − 8 = 3	10 − 4 = 6	12 − 3 = 9	13 − 6 = 7	11 − 7 = 4	9 − 5 = 4
10 − 2 = 8	14 − 6 = 8	11 − 9 = 2	12 − 7 = 5	13 − 4 = 9	10 − 7 = 3
13 − 8 = 5	8 − 0 = 8	11 − 3 = 8	9 − 2 = 7	14 − 5 = 9	12 − 4 = 8
7 − 7 = 0	14 − 9 = 5	9 − 8 = 1	10 − 6 = 4	13 − 8 = 5	10 − 8 = 2
9 − 4 = 5	10 − 3 = 7	13 − 9 = 5	9 − 7 = 2	12 − 9 = 3	
13 − 6 = 7	10 − 5 = 5	14 − 8 = 6	12 − 5 = 7	11 − 4 = 7	
13 − 4 = 9	11 − 6 = 5	10 − 1 = 9	12 − 8 = 4	14 − 7 = 7	

Using the Book Panels 1–8: Tell the child to subtract.

2. Have the children stand in 2 rows facing each other. Give one child a ball. The child holding the balls calls out a subtraction fact from 13 or 14. Then the child tosses the ball to a child in the opposite row. This child must give the answer and then call out a different subtraction fact. If the child answers incorrectly, the child sits down. Repositioning the children may be necessary to keep the rows even. The last child remaining with the ball wins.

3. Use Bulletin Board Suggestion 2b in the Chapter Overview.

4. Give the children oral practice in subtraction facts to 14. Call out a subtraction fact. Have the children take turns around the room giving the answers.

5. Use Bulletin Board suggestion 1 in the Chapter Overview.

EXTRA PRACTICE

Tell the child to subtract.

1.	11 − 7 = 4	14 − 9 = 5	12 − 8 = 4	13 − 7 = 6	14 − 6 = 8
2.	10 − 4 = 6	11 − 3 = 8	14 − 7 = 7	12 − 6 = 6	13 − 4 = 9
3.	9 − 9 = 0	14 − 5 = 9	12 − 7 = 5	11 − 2 = 9	13 − 5 = 8
4.	13 − 6 = 7	10 − 3 = 7	13 − 8 = 5	14 − 8 = 6	9 − 7 = 2
5.	10 − 5 = 5	13 − 9 = 4	12 − 3 = 9	11 − 4 = 7	10 − 2 = 8

RELATED AIDS

ACT. MASTERS—18, 20, 26.
—Seasonal 3, 4.
—Gen. Use 10, 11, 13.
BFA COMP LAB I—46, 47.
BFA PROB. SOLVING I—62, 65, 66.

OBJECTIVE

To find sums and differences in related additions and subtractions, sums 13 and 14, vertical form

PACING

Level A All (1-5 guided)
Level B All (1-4 guided)
Level C All (1-4 guided)

MATERIALS

7 red blocks, 7 yellow blocks

SUGGESTIONS

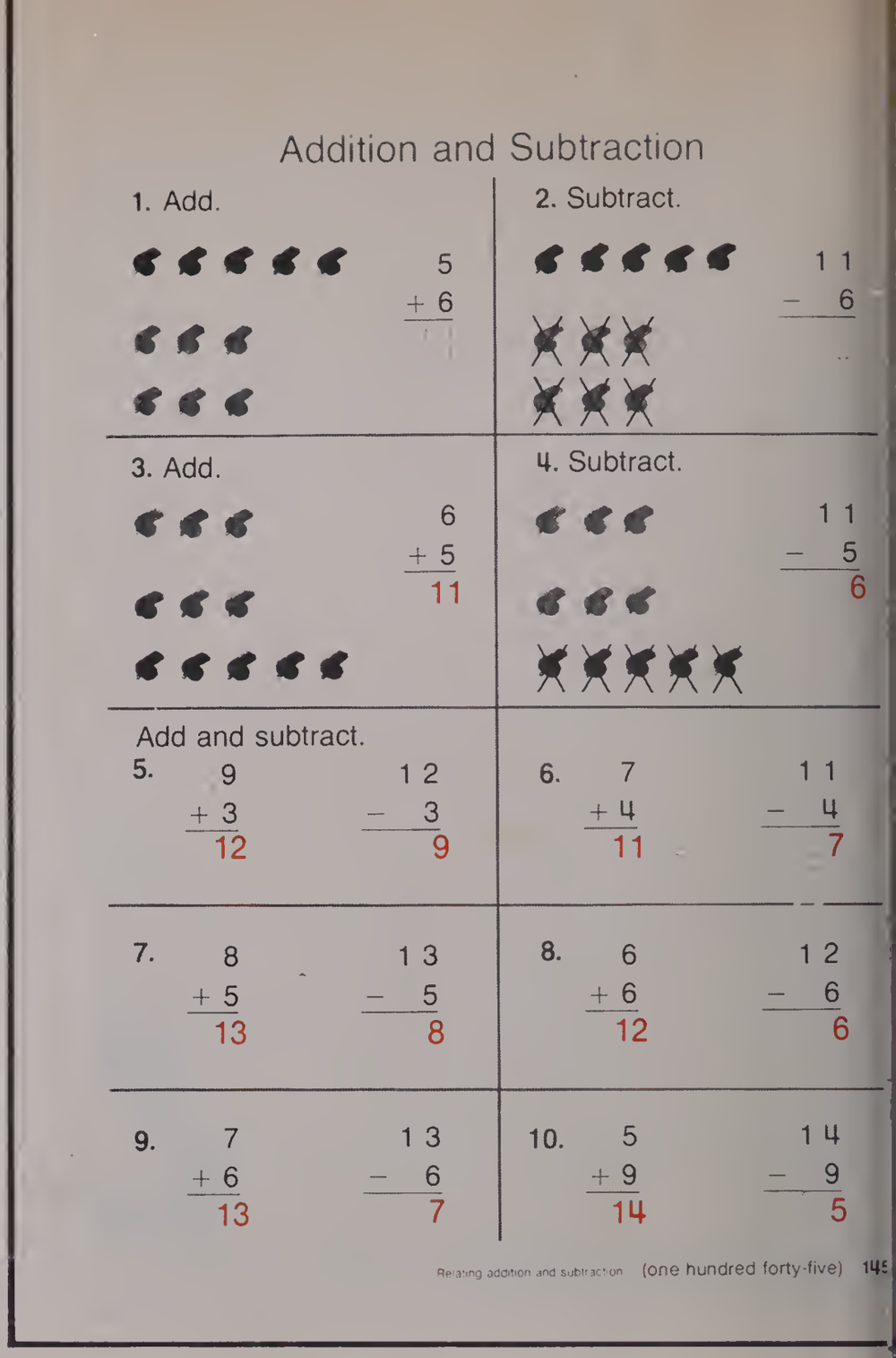
Initial Activities Show a set of 7 red blocks. Ask a child to put 5 yellow blocks next to the 7 blocks. Ask, "How many in all? (12)" Write:

$$\begin{array}{r} 7 \\ +5 \\ \hline \end{array} \qquad \begin{array}{r} 12 \\ -\ 5 \\ \hline \end{array}$$

Have the child give the sum. Then ask another child to "undo" what the other child did by removing the 5 yellow blocks. Ask, "How many are left? (7)" Have the child give the difference. Repeat the activity for the following:

$$\begin{array}{r} 5 \\ +7 \\ \hline \end{array} \qquad \begin{array}{r} 12 \\ -\ 7 \\ \hline \end{array}$$

Repeat for 11, 13 and 14.



Using the Book Panels 1-2: Relate the addition to the picture by telling a story: "Ali had 5 whistles. He bought 6 new whistles. How many whistles does he have in all? (11) Five plus 6 is what number?" Have the child trace 11.

For the subtraction, say, "Ali had 11 whistles in all. He gave away 6 whistles." Have the child trace the X's to show 6 taken away. Ask, "How many whistles are left? (5) Eleven minus 6 is what number? " Have the child trace 5. Tell the child that these two exercises are related addition and subtraction. Explain that the exercises show adding 6 to 5 to get a sum, then subtracting 6 from that sum.

Panels 3-4: Point out that the order of the addends is changed to show adding 5 and subtracting 5. You may have the child make up similar stories as in panels 1 and 2 and complete the panels.

Panels 5-10: Have the child add and subtract for each pair of exercises.

dd and subtract.

7 + 4 = 11	11 − 4 = 7	4 + 7 = 11	11 − 7 = 4
6 + 7 = 13	13 − 7 = 6	7 + 6 = 13	13 − 6 = 7
9 + 3 = 12	12 − 3 = 9	3 + 9 = 12	12 − 9 = 3
8 + 6 = 14	14 − 6 = 8	6 + 8 = 14	14 − 8 = 6
4 + 9 = 13	13 − 9 = 4	9 + 4 = 13	13 − 4 = 9
6 + 6 = 12	12 − 6 = 6		
7 + 7 = 14	14 − 7 = 7		

AT HOME: Read some of these exercises and have the child tell you the answers. Say, "What is 7 plus 4?" and so on.

46 Practice, families

Using the Book Panels 1-7: Tell the child to add and subtract for each pair of exercises.

At Home: After finishing the pupil page, the child may take it home and complete the At Home activity at the bottom of the page.

ACTIVITIES

1. Use the Domino Cards in the Activity Reservoir to practice addition and subtraction facts to 14.

2. Draw a hopscotch diagram on the chalkboard. Write an addition or subtraction sums 11 to 14 (at random) in the squares. As the child moves from square to square, he or she must call out the sum or difference.

3. Have the child play the ladder Game in the Activity Reservoir. Use addition and subtraction facts to 14.

4. Adapt the "hopscotch" game above. Write the numerals 1 to 12 (at random) in the squares. The child calls out an addition or subtraction whose answer is the number in the square. For example, for the number 5, the child might say 2 plus 3 or 12 minus 7.

5. Have the child play Stop the Magician as described in the Activity Reservoir. Use basic facts to 14.

EXTRA PRACTICE

Have the child add and subtract for each pair of exercises.

1.	3 + 8 = 11	11 − 8 = 3	8 + 3 = 11	11 − 3 = 8
2.	9 + 5 = 14	14 − 5 = 9	5 + 9 = 14	14 − 9 = 5
3.	2 + 9 = 11	11 − 9 = 2	9 + 2 = 11	11 − 2 = 9
4.	4 + 8 = 12	12 − 8 = 4	8 + 4 = 12	12 − 4 = 8

RELATED AIDS

ACT. MASTERS—26.

OBJECTIVE

To solve word problems

PACING

Level A	All (guided)
Level B	All (1 guided)
Level C	All

MATERIALS

word problems (for sums 13 and 14) on index cards

SUGGESTIONS

Initial Activities The career for this page is musicians. (See the Chapter Overview.) Encourage the child to name his or her favorite group of musicians and name his or her favorite instrument. Point out that musicians entertain people, work in public places, and are constantly dealing with the public.

Prepare problems similar to those on page 147. Have the child read and solve them.

ACTIVITIES

1. Encourage the child to think in terms of 10. Show one of the addition practice cards with sums 11, 12, 13, and 14. The child tells how much more than 10 the sum is.

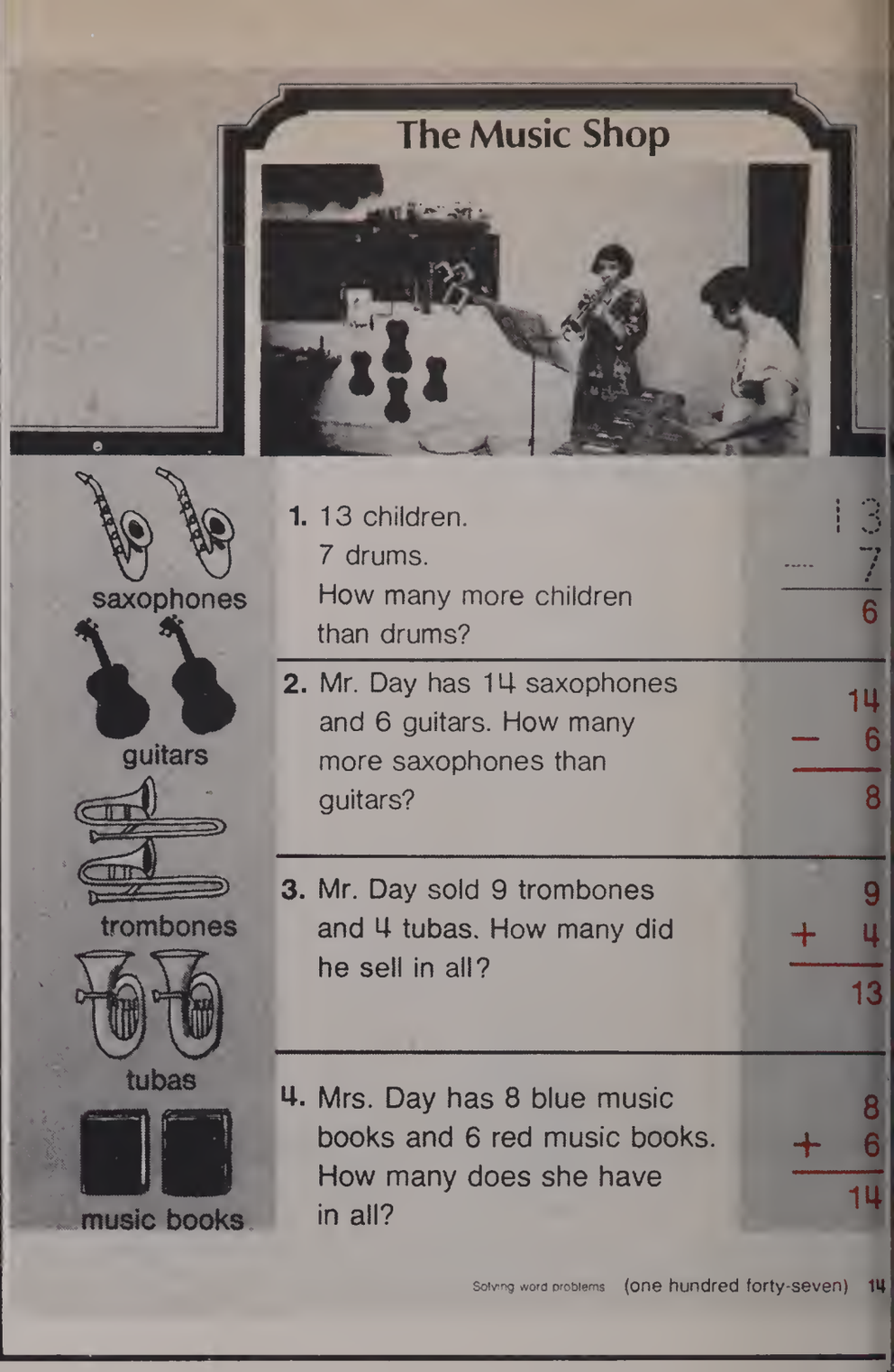
2. The class might enjoy listening to recordings of the instruments shown on this page. Have them discuss the sounds of instruments.

3. Have the class cut out pictures of musicians or musical instruments from magazines or newspapers. Have children paste on posters and label each poster, such as 4 horns. Display.

4. Show the child an addition or subtraction for sum 13 or 14. Challenge the child to write a problem to go with the computation and solve the problem.

RELATED AIDS

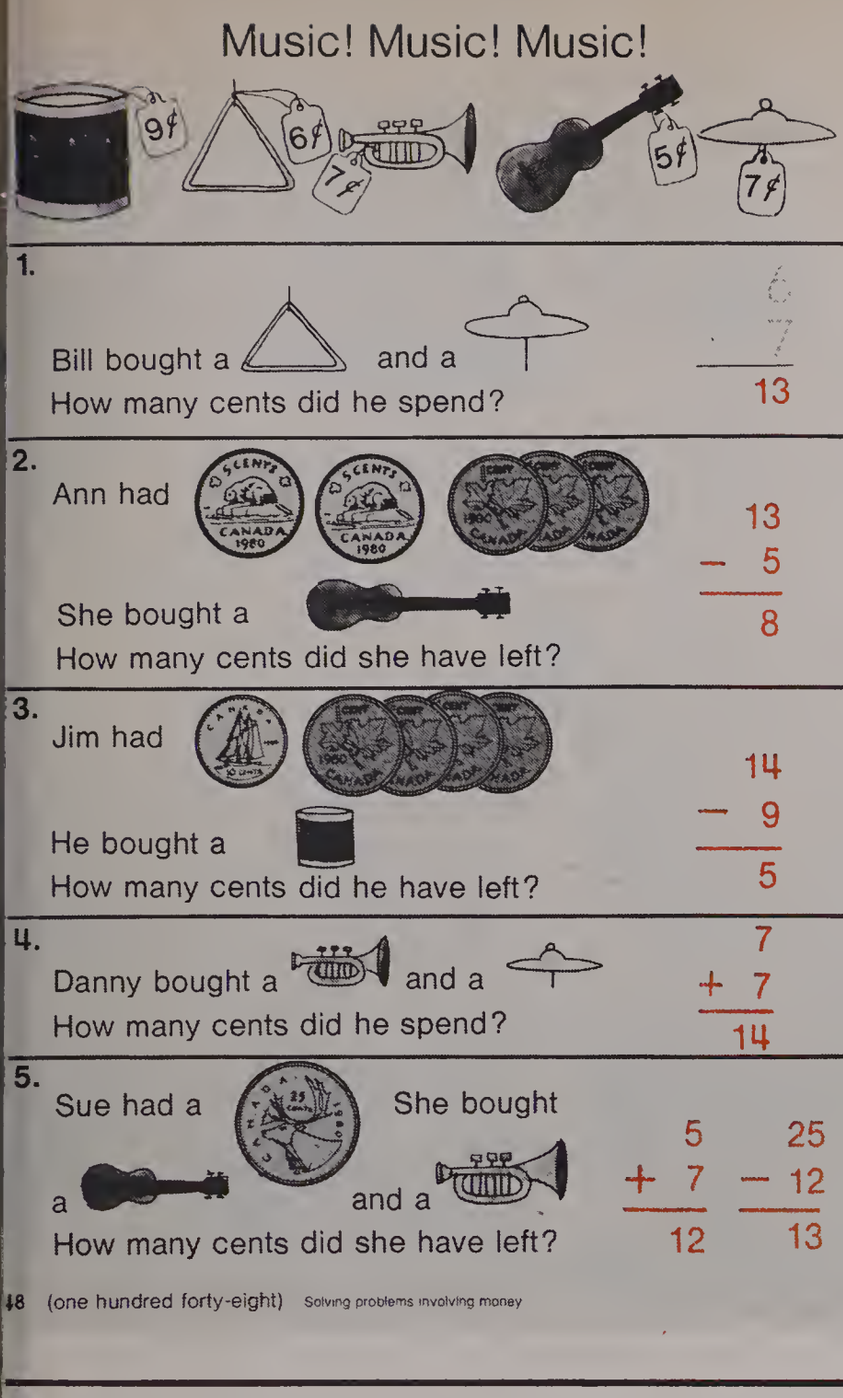
ACT. MASTERS—Seasonal 5.
BFA PROB. SOLVING 1—70, 72.



Using the Book Discuss the picture at the top of the page. (See Career Awareness in the Chapter Overview.) Have the child name the instruments in the picture dictionary on the left.

Panel 1: Have the child read the problem. Ask, "Do we add or subtract? (subtract)" Then direct the child to the subtraction on the right. Ask where the numbers came from. Tell the child to trace the exercise and find the difference. Ask, "How many more drums are needed? (6)"

Panels 2-4: Have the child read the problem, decide whether to add or subtract, and write the subtraction or addition on the screen on the right. Then find the answer.



Using the Book Ask the child to name each musical instrument and tell how much it costs.

Panel 1: Assist the child in reading the problem. Explain that the child must return to the top of the page to find the prices of the instruments. Ask, "How much does the triangle cost? (6¢) How much did the cymbal cost? (7¢)" Direct the child to the addition on the right. Tell the child to trace the problem and find the sum.

Panels 2-4: Assist the child, when necessary, in reading the problem. Then have the child solve each problem, showing the computation on the right.

Panel 5: For the problem in panel 5, ask the child to describe the procedures or steps necessary to solve the problem. (Add the cost of the guitar and the cost of the horn, then subtract the sum from 25.) Then have the child find the answer.

OBJECTIVE

To solve money problems

PACING

Level A	(Initial Activities only)
Level B	1-4 (1-2 guided)
Level C	All (1-2 guided)

MATERIALS

articles with price tags (6¢, 7¢, and 8¢); index cards with problems on them; play money

SUGGESTIONS

Initial Activities Show articles with price tags on them. Prepare problems similar to those on the page on file cards. Encourage the child to read each problem, dramatize it with the articles and play money, and then solve it.

Discuss the consumer aspect of this page—associating money with buying. Point out the importance of adding and subtracting money and receiving change.

ACTIVITIES

1. Children might enjoy making their own store. Obtain a large carton, open at the front. Place articles with price tags on them in the box. Allow them to use a toy cash register to record sales. Use toy or real money.

2. Prepare a 12 cm by 12 cm grid on a very large poster for an on-going project. At the top of each cell, write 1¢ through 25¢. Children are to collect empty items costing from 1¢ to 25¢ and paste or pin to the appropriate cells. Have children fill each cell with different items.

3. Show articles with price tags on them. Challenge the child to create problems involving addition and subtraction of sums 11-14.

OBJECTIVE

To find sums and missing numbers

PACING

Level A	All, colored cells only (1-4 guided)
Level B	All, colored cells only (1-4 guided)
Level C	All, complete puzzles (1 guided)

SUGGESTIONS

Initial Activity Draw two number puzzles, one similar to Panel 2 and one similar to Panel 4 on page 149. Discuss the procedures to complete each puzzle as described in Using the Book.

ACTIVITIES

1. It might be beneficial for the child to review addition of sums 11 and 12. Use Basic Fact Wheels described in the Activity Reservoir.

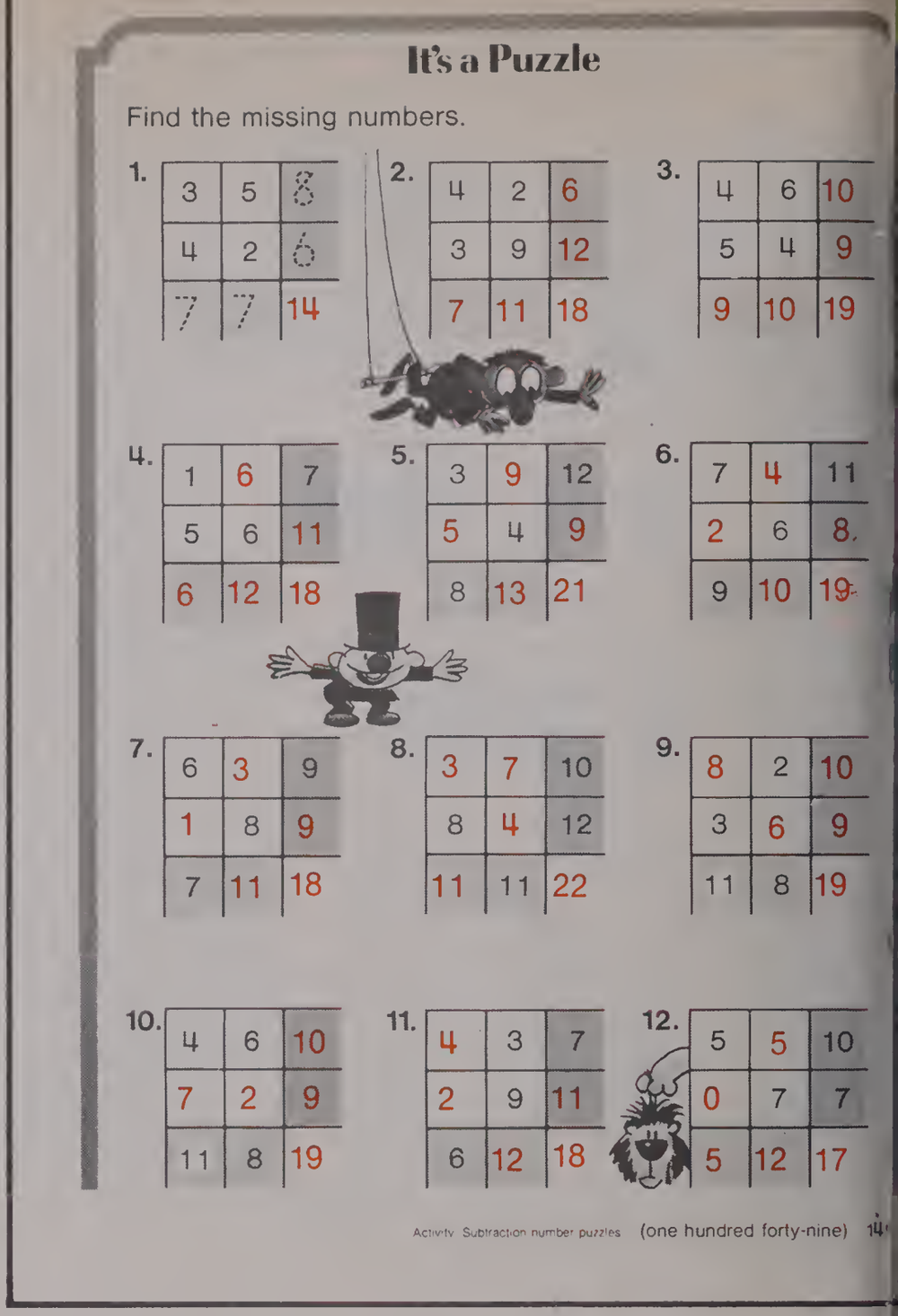
2. You might create some number puzzles like those suggested in Number Puzzles, Item 4, of the Activity Reservoir, for practice with sums to 12.

3. Prepare worksheets with several rows of numbers. In each row, place in sequence one or more pairs of numbers that add to 11. Challenge the child to circle adjacent pairs of numbers in each row whose sum is 11. Prepare a similar worksheet for sum 12.

4. For Panels 1-12 on page 149 have the child find the "sum of the sums." That is, the child adds the numbers in the purple frames, then numbers in the green frames. Also note that these "sums of the sums" are the same number. For example in Panel 1, 14 is the sum of 3, 5, 4, and 2.

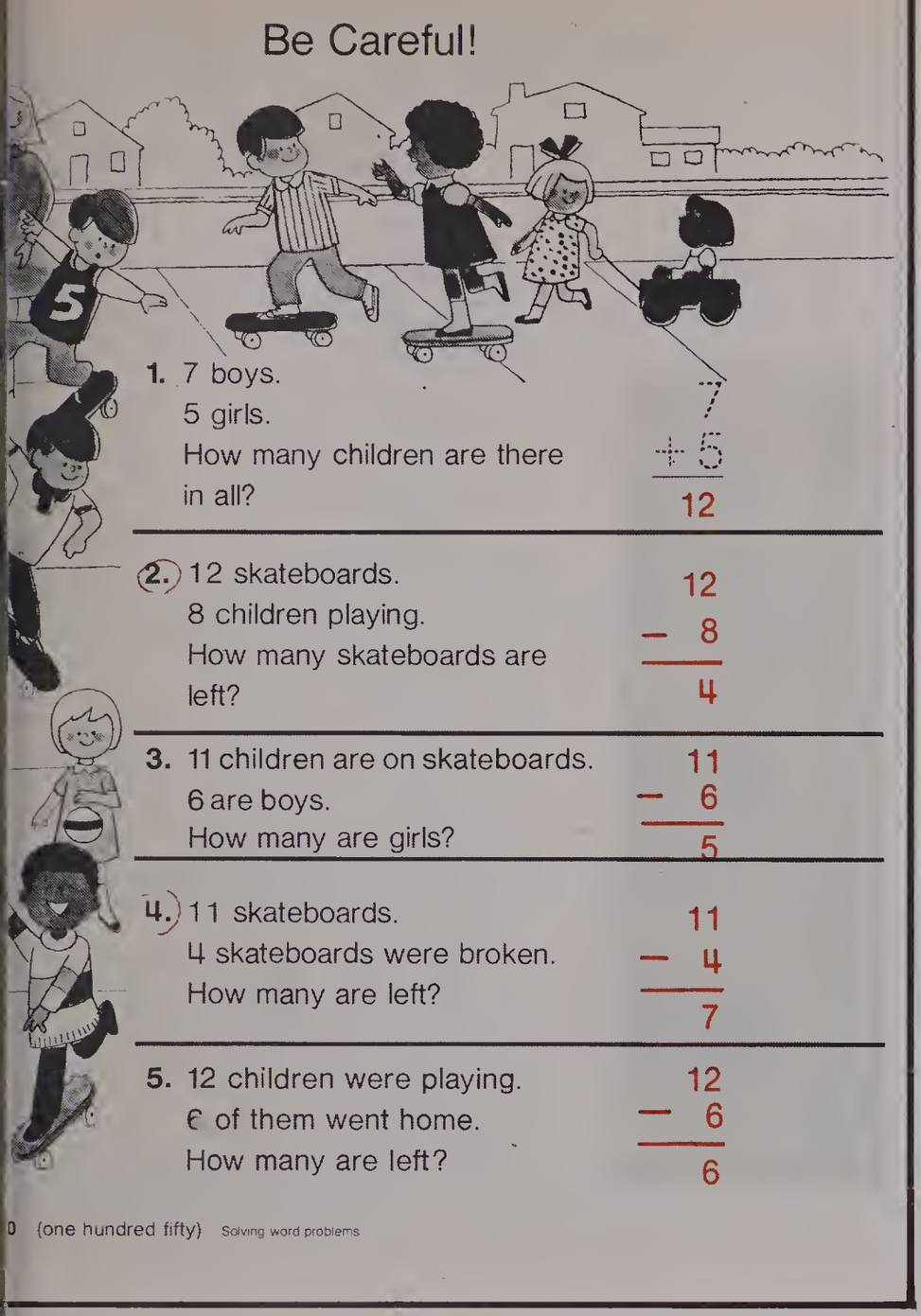
RELATED AIDS

ACT. MASTERS—27.



Using the Book This is an activity page. Remind the child that in these number puzzles, addends are given in yellow squares and sums are given in purple and green squares. Complete panels 1-12 as done in the first puzzle.

Puzzle 1: Ask the child to name the addends in this puzzle. Then have the child name and trace the sums. Tell the child there are four addition sentences shown in this puzzle. See if the child can give them: $3 + 5 = 8$, $4 + 2 = 6$, $3 + 4 = 7$, $5 + 2 = 7$. Then ask, "Eight plus 6 is equal to what number? (14) Seven plus 7 is equal to what number? (14)" Have the child fill in the empty box. Explain that the number in the empty square must be the sum of the addends in the purple squares as well as the addends in the green squares. Tell the child to check by adding across and then down. Ask questions such as for puzzle 4, "One plus what number is equal to 7? (6)" Have the child complete the other number puzzles independently.



Using the Book Tell the child to look at the picture at the top of the page. You may wish to have the child tell about experiences with similar toys.

Panel 1: Have the child read the problem. Then ask, "How many boys? (7) How many girls? (5) How many in all? (12)" Have the child look at the addition on the right and trace each numeral as you explain how the addends were taken from the word problem. Then, have the child find the sum.

Panels 2-5: Proceed in a similar way assisting the child or having the child work independently.

OBJECTIVE

To solve word problems

PACING

Level A	All (1-2 guided)
Level B	All (1 guided)
Level C	All

SUGGESTIONS

Initial Activities 1. Write some addition and subtraction exercises. For each exercise, challenge the child to make up a problem that goes with the exercise and then solve it.

2. When solving problems you may encourage the child to dramatize some of the problems.

ACTIVITIES

1. Give the child twelve blocks. Create some addition and subtraction problems with sums 10, 11, and 12 concerning everyday life activities. The child may use the blocks and dramatize each problem and then write the computation in vertical form

2. Give the child four cards, each with an addition or subtraction, sums 12 or less. Encourage the child to cut out pictures, make up story problems for each card, and then solve them.

3. You might challenge the child to create his or her own problems similar to those on the pupil page and solve them.

4. Give the child this mini-problem: "96 second graders, 52 are girls. How many are boys?"

RELATED AIDS

ACT. MASTERS—Seasonal 5.
BFA PROB. SOLVING I—70, 72.

OBJECTIVE

To solve word problems

PACING

Level A	All (1-2 guided)
Level B	All (1 guided)
Level C	All

MATERIALS

word problems on file cards

SUGGESTIONS

Initial Activity You might check to see if the child will experience difficulty in solving problems of the type on page 151 by having the child read and work problems written on file cards. When the child appears to work satisfactorily, assign the problems on page 151.

ACTIVITIES

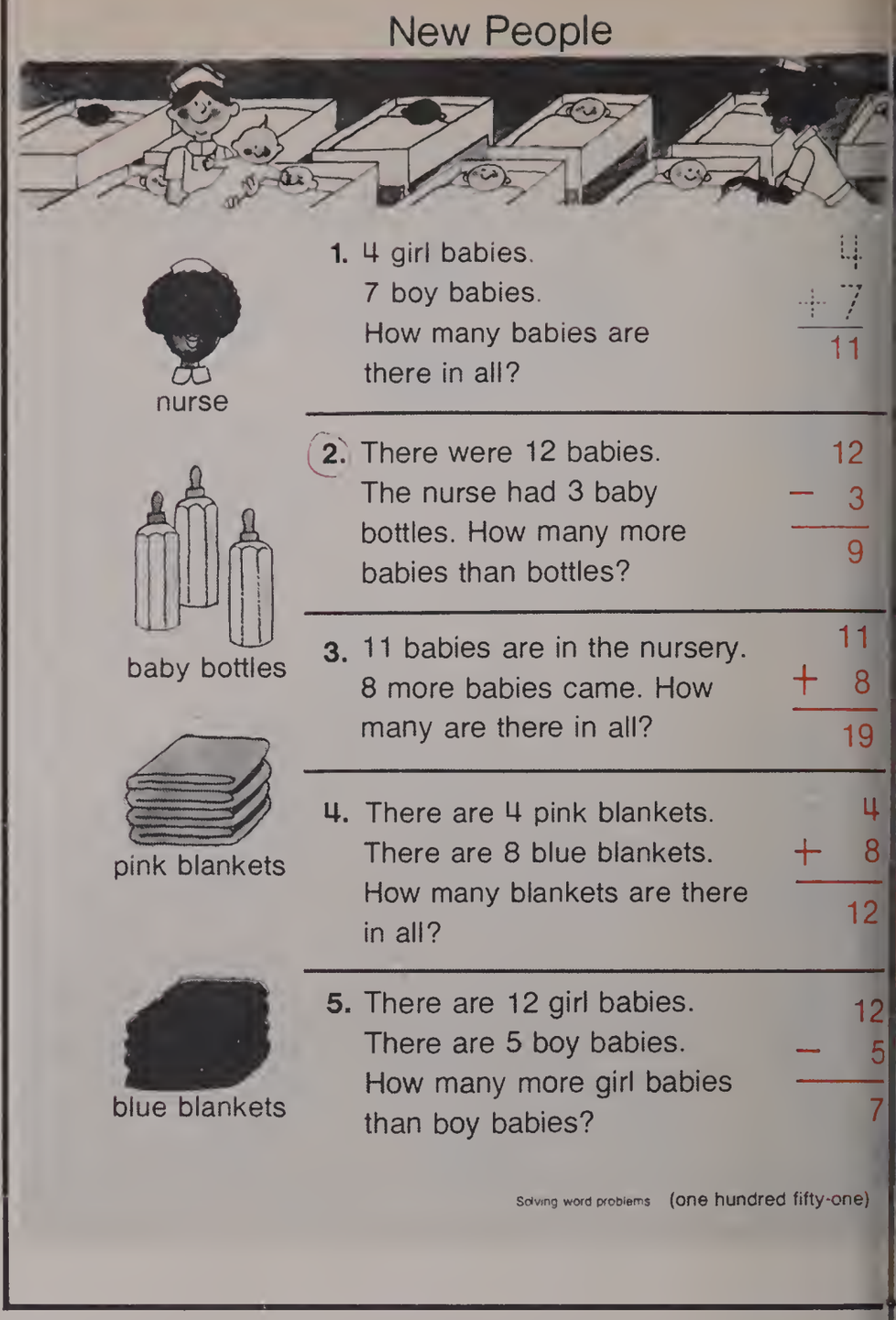
1. The child might benefit from a review of basic addition and subtraction facts to sum 12. Bingo as described in the Activity Reservoir may be played. Use sums or differences in the cells.

2. Provide the child with practice in solving oral problems. Dictate a problem similar to those on page 151, using a nursery theme, and have the child dramatize the problems with blocks or paper cutouts.

3. Supply the child with a familiar picture or have the child cut out pictures (from magazines or newspapers) of things found in a nursery. Then challenge the child to write problems about the picture and solve them.

RELATED AIDS

ACT. MASTERS—Seasonal 5.
BFA PROB. SOLVING I—70, 72.



New People

nurse

1. 4 girl babies.
7 boy babies.
How many babies are there in all?

$$\begin{array}{r} 4 \\ +\ 7 \\ \hline 11 \end{array}$$

baby bottles

2. There were 12 babies. The nurse had 3 baby bottles. How many more babies than bottles?

$$\begin{array}{r} 12 \\ -\ 3 \\ \hline 9 \end{array}$$

3. 11 babies are in the nursery. 8 more babies came. How many are there in all?

$$\begin{array}{r} 11 \\ +\ 8 \\ \hline 19 \end{array}$$

pink blankets

4. There are 4 pink blankets. There are 8 blue blankets. How many blankets are there in all?

$$\begin{array}{r} 4 \\ +\ 8 \\ \hline 12 \end{array}$$

blue blankets

5. There are 12 girl babies. There are 5 boy babies. How many more girl babies than boy babies?

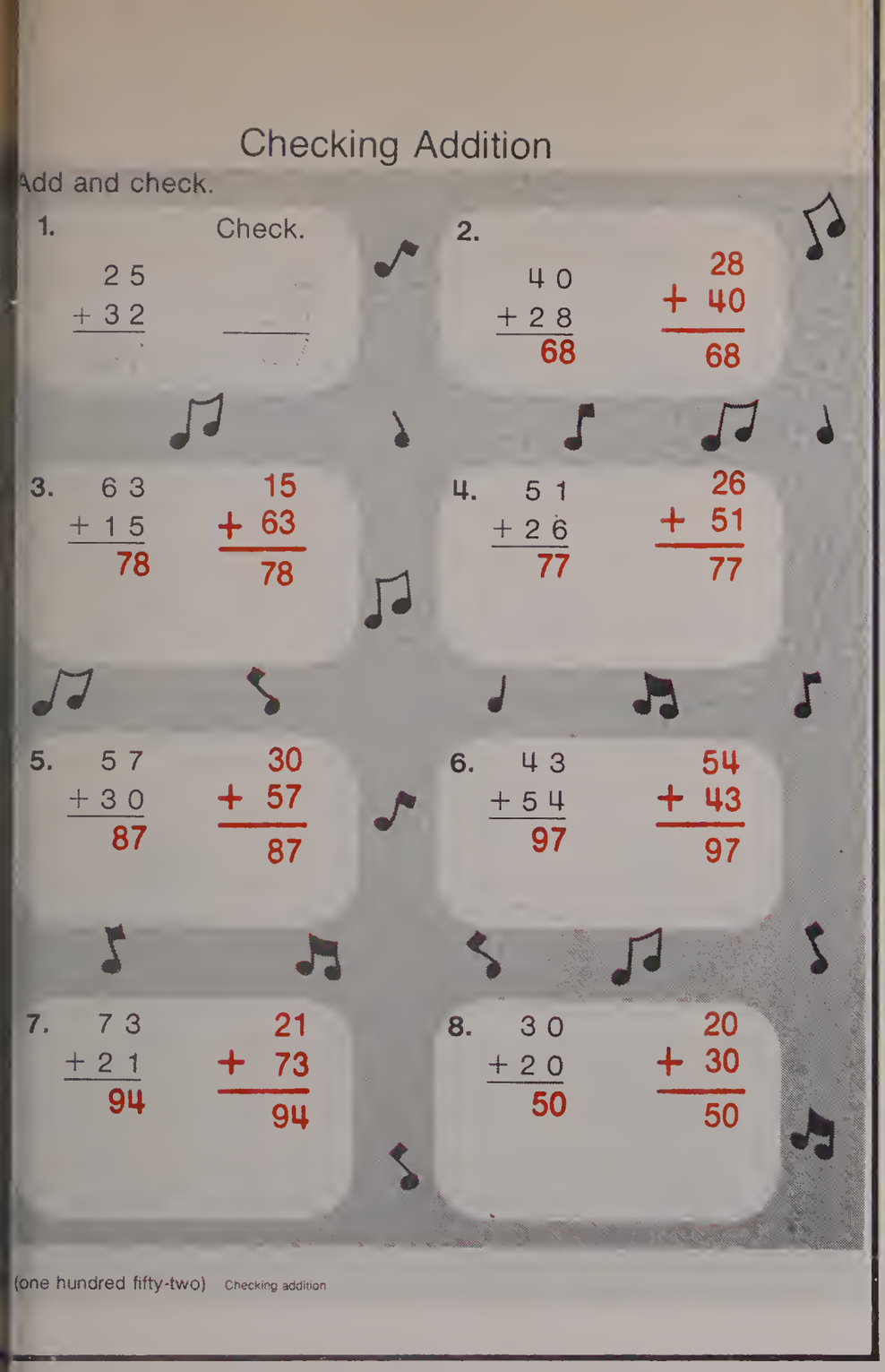
$$\begin{array}{r} 12 \\ -\ 5 \\ \hline 7 \end{array}$$

Using the Book Encourage the child to describe the picture. If the child seem to be interested in this theme, you might wish to extend your discussion.

Panel 1: Have the child read the problem. Direct the child to the addition on the right. Ask, "Where did the 4 and the 7 come from? (4 girls, 7 boys)" Have the child trace the exercise and find the sum. Then ask, "How many babie in all? (11)"

Panel 2: The question "How many more babies than bottles?" (Panel 2) is in relation to "How many more bottles are needed (to give each baby one)?" Discuss this with the children. Then give the class this question: There are 6 blankets. There are 14 babies. How many more blankets are needed to give eacl baby a blanket?

Panels 3-5: Have the child read the problem and write an addition or subtraction on the right.



Using the Book Panel 1: Ask the child to name the addends in the first addition, 25 + 32. Have the child add and trace the sum. Explain that we may change the order of the addends and add to check the answer in an addition exercise. Have the child read and trace the second addition, 32 + 25. Ask, "Did we change the order of the addends? (yes)" Have the child add and trace the sum. Then ask, "Did changing the order of the addends change the sum? (no)"

Panel 2: Ask the child to find the sum. Then ask the child to change the order of the addends and add again to check the answer.

Panels 3-8: Tell the child to find each sum and check each answer by changing the order of the addends and finding the sum again.

OBJECTIVES

To add and check, using two-digit numerals

PACING

Level A	(Initial Activities only)
Level B	All (1-3 guided)
Level C	All (1-2 guided)

VOCABULARY

check

SUGGESTIONS

Initial Activity Write:

$$\begin{array}{r} 43 \\ +31 \\ \hline \end{array}$$

Have the child find the sum. Then ask the child to change the order of the addends and add. Ask, "Did you get the same answer? (yes)" Explain that this is one way to check an addition—change the order of the addends, then add to see if you get the same answer.

ACTIVITIES

1. Adapt the Hopscotch game described on page 145. Write the additions and subtractions inside the squares. Have the child give the sums or differences.

2. Adapt the game, Stop the Magician as described in the Activity Reservoir. Use exercises similar to the ones on page 152. One team writes the exercise and solves, while the other team writes the check for the same exercises.

3. Provide children with a large container of about 100 small objects. Have the child show sets for each addend in Panels 1-4 on page 152 to verify the sums.

OBJECTIVE

To subtract and check, using two-digit numerals

PACING

Level A (Initial Activities only)
Level B All (1–3 guided)
Level C All (1–2 guided)

SUGGESTIONS

Initial Activities Write:

8	5
- 3	+ 3

Have the child find the difference and then the sum. Ask, "What number did you subtract from 8? (3) What is the difference? (5) Is 5 + 3 equal to 8? (yes)" Tell the child, "This addition is a way to check the answer in the subtraction 8 - 3 = 5." Now use this method of checking subtraction on greater numbers. Write:

Subtract	Check
87	63
- 24	+ 24

Have the child find the difference. Have the child add (63 and 24) to check the subtraction.

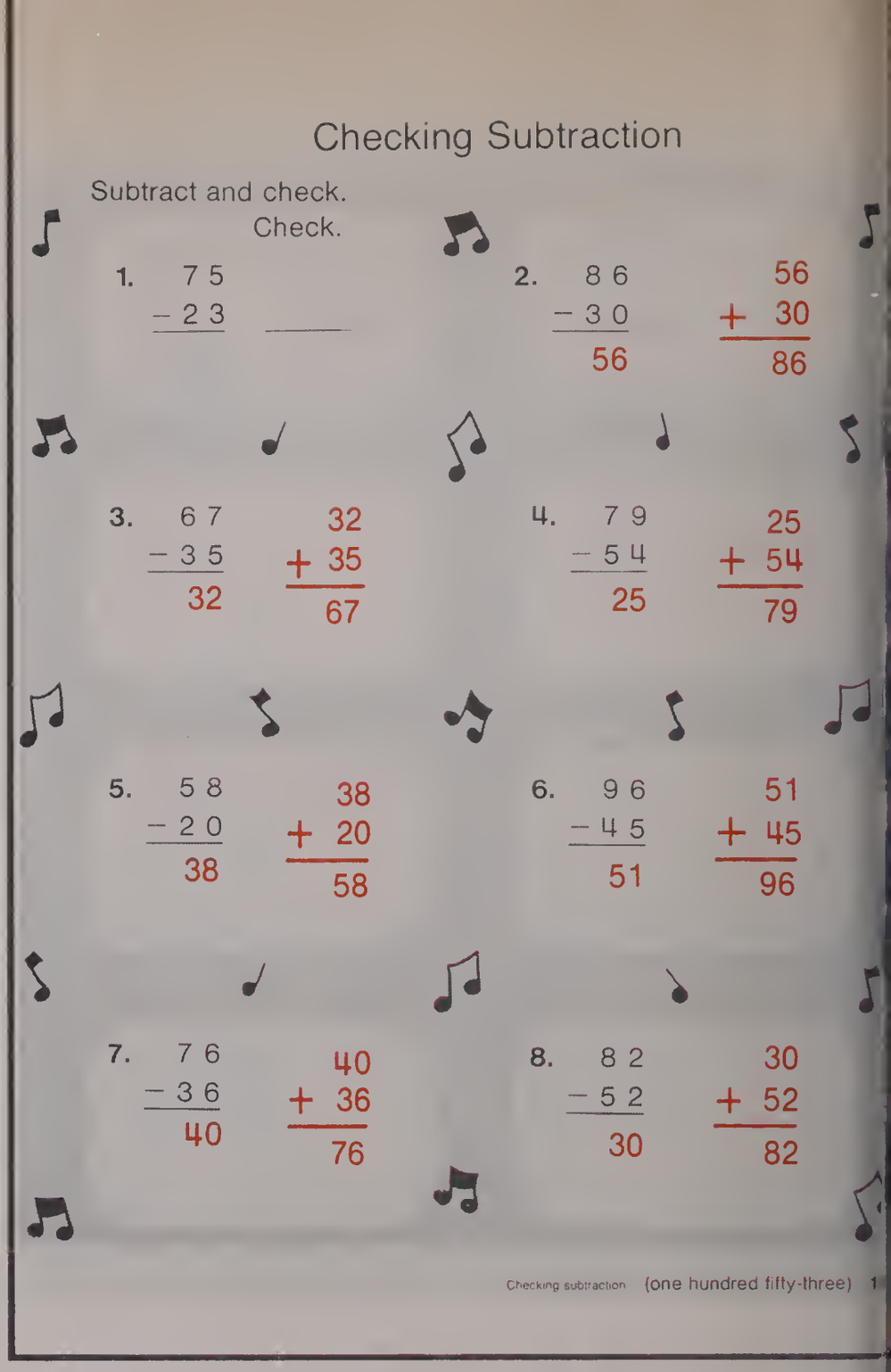
ACTIVITIES

1. Play a Take Away game. Give the child 57 small objects. Say, "Take away 23." The child says the answer, 34. Then say, "Show me 34 objects. Now add 23 objects. How many in all? (57)"

2. Use the Basic Fact Wheels described in the Activity Reservoir for sums and differences through sum 14.

3. Challenge the child to find the sum and name the missing ones digit.

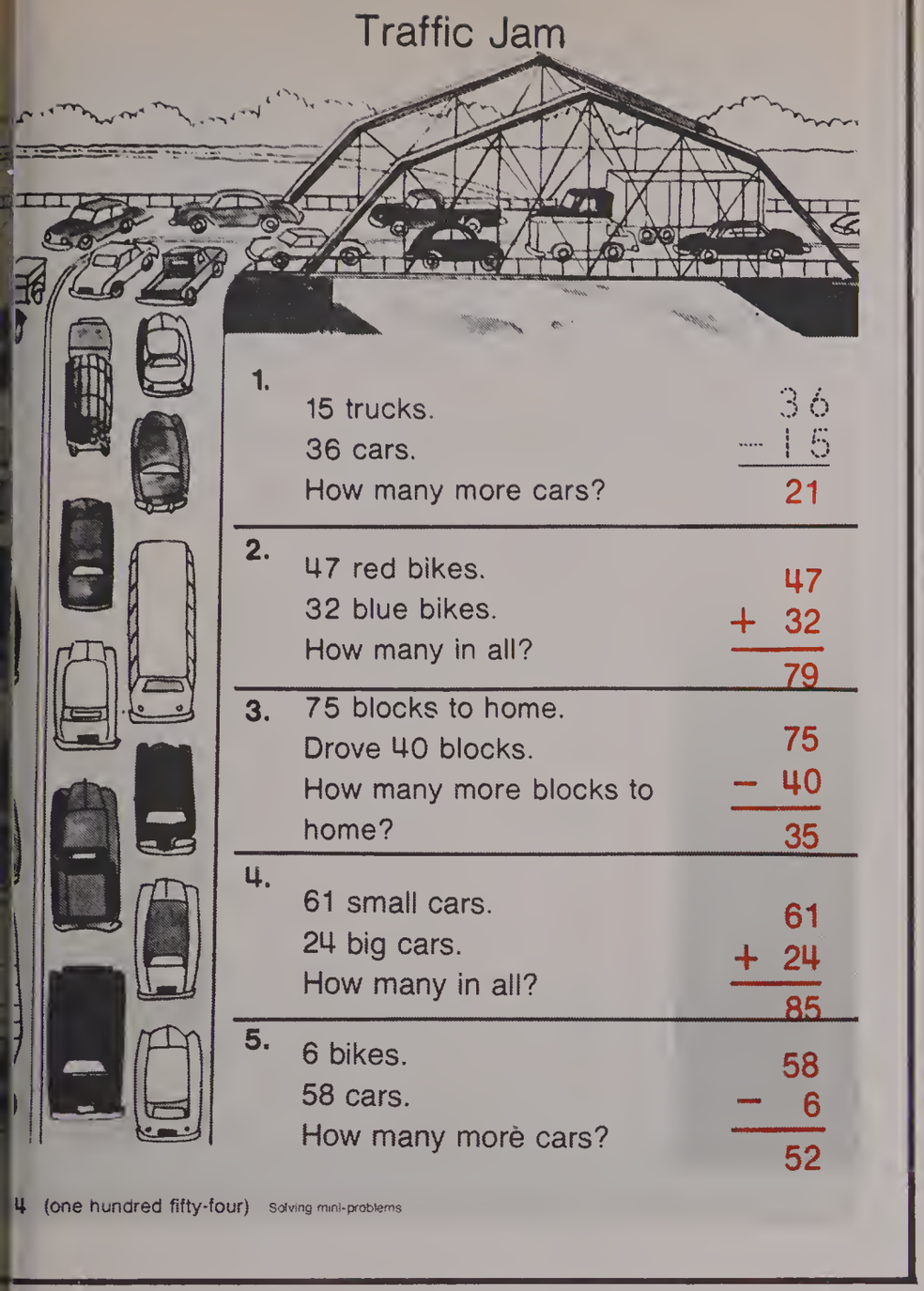
8	36
-51	+51



Using the Book Panel 1: Ask the child to subtract and trace the answer. Tell the child we can check to see if the answer is correct. Tell the child to add the difference and the number subtracted to check the answer. Have the child trace 52 + 23. The child may pair the difference 52 with the addend 52. Then the child may pair the 23 in each computation. Ask, "When 52 and 23 are added, what is the sum? (75)" Have the child trace 75. Then the child may pair the 75 in each of the computations.

Panel 2: Have the child subtract. Then have the child write the addition exercise to check the answer in the subtraction. Ask, "What must the sum be for the answer in the subtraction to be correct? (86)" Then the child finds the sum and compares the answer with the 86 in the subtraction.

Panels 3–8: Tell the child to subtract and check the answer by adding.



Using the Book Have the child describe the picture. Ask if the child has ever been in a traffic jam. If so, have the child describe what it was like.

Panel 1: Have the child read the problem. Elicit the idea that 15 must be subtracted from 36 to find the answer. Direct the child to trace the problem and to find the difference. Ask, "How many more cars are there than trucks? (21)" Have the child write the answer.

Panels 2-5: Have the child read each problem and decide whether to add or subtract. Then the child writes the addition or subtraction on the right, finds the sum or difference, and answers the question posed in each problem.

OBJECTIVES

To solve mini-problems

PACING

Level A	All (1-2 guided)
Level B	All (1-2 guided)
Level C	All (1-2 guided)

SUGGESTIONS

Initial Activity Have the child read and work a few mini-problems you create.

Inspire a discussion on the consumer aspect of this page. Ask questions such as:

What is a traffic jam? (cars not moving on street or highway)
What mostly causes it? (too many cars)
Why are traffic jams bad? (They cause air pollution, use up fuel, and are uneconomical in time for workers.)

Point out that traffic jams can be avoided by reducing the congestion on roads. This can be done with public transportation and car pools that lend themselves to several benefits: cost per kilometre is less because the cost is shared by a group of people; there is fuel saving—conservation of natural resources; and cleaner air which can lead to improved health.

ACTIVITIES

1. Show 67 red and yellow blocks (25 of them yellow). Tell the child there are 67 blocks in all and 25 are yellow. Ask, "How many are red?" Have the child show how to find the answer by subtraction. You might want the child to check the answer by using the blocks.

2. Have the child use Basic Fact Practice Cards described in the Activity Reservoir, to practice sums through 14.

3. Involve the child in oral or chalk-board drill for practicing basic addition and subtraction facts through sum 14.

OBJECTIVE

To add and subtract using two-digit numerals, no regrouping

PACING

Level A	All (1 guided)
Level B	All (1 guided)
Level C	All (1 guided)

SUGGESTIONS

Initial Activity 1. Use a sequence of cells similar to those described in the initial activity on page 89.

2. Use a place value chart to emphasize the number of tens and ones for each numeral.

Subtract

Tens	Ones
7	6
3	3
4	3

76
−33

Emphasize that ones are subtracted from ones; that tens are subtracted from tens and that we always begin with ones.

ACTIVITIES

1. Involve the child in making a caterpillar as described in Item 3 of Number Puzzles in the Activity Reservoir. Include additions with sums 14 and less and subtracting from numbers 14 and less.

2. Conduct an oral practice session. Write sentences like these:

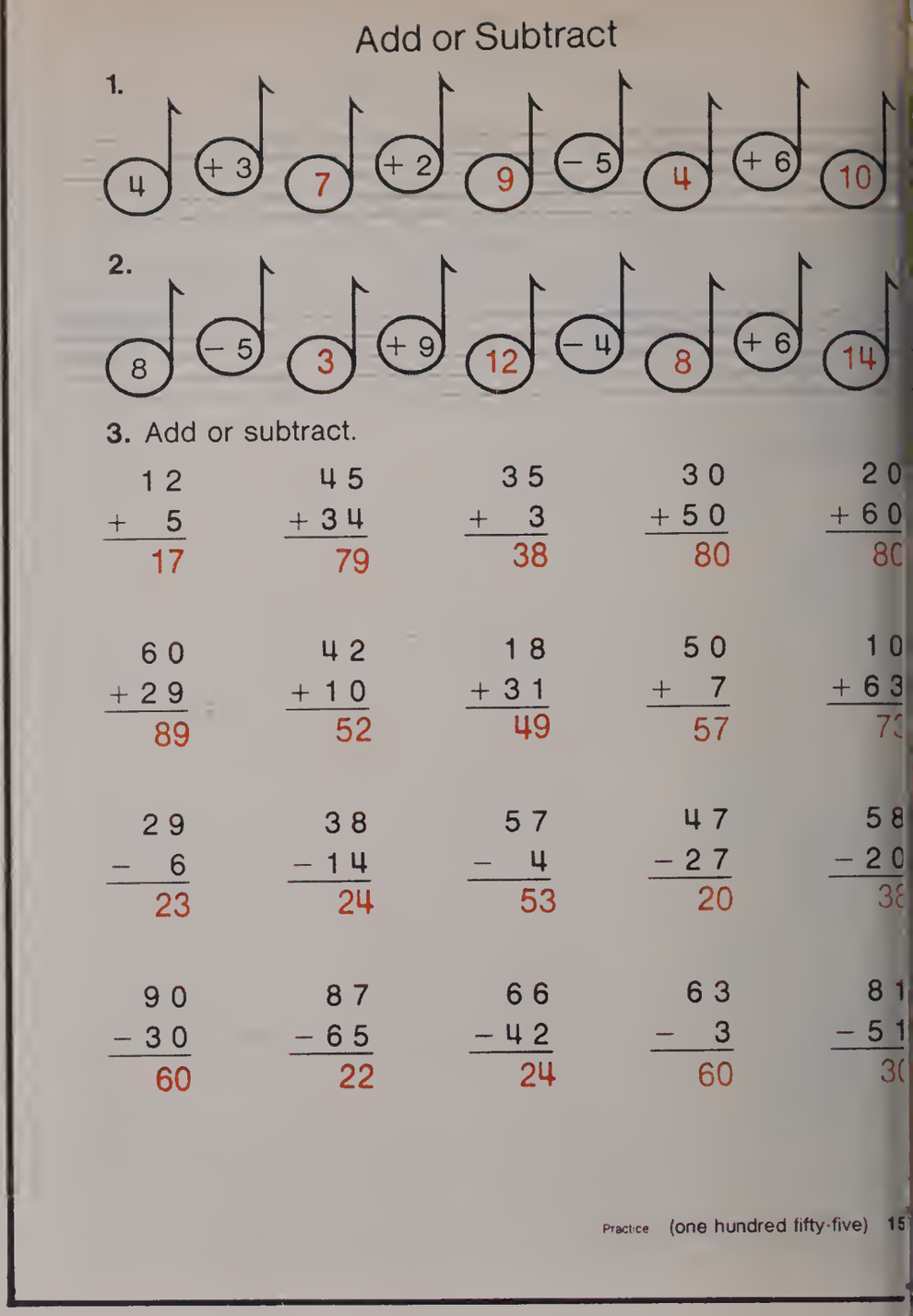
$$6 + 8 - 7 - 4 + 9 = 12$$

Read each sentence to the child in this manner: "6 plus 8 (pause), minus 7 (pause), minus 4 (pause), plus 9 is equal to what number? (12)"

3. Have the child complete a puzzle as in Item 3 of Number Puzzles in the Activity Reservoir. Include addition and subtraction, sums 14 and less.

4. Show 67 red and yellow blocks (25 of them yellow). Tell the child there are 67 blocks in all and 25 are yellow. Ask, "How many are red?" Have the child show how to find the answer by subtraction. You might want the child to check the answer by using the blocks.

5. Have the child use Basic Fact Practice Cards described in the Activity Reservoir, to practice sums through 14.



Using the Book Panel 1: Explain that the child is to add or subtract according to the instruction on the musical notes. Ask, "What number is on the first musical note? (4) What number is on the second musical note? (3) What does + mean? (to add) What is 4 + 3? (7)" Have the child write 7 on the third musical note. Ask, "What number is on the next musical note? (2) What is 7 + 2? (9)" Have the child write 9 on the fifth musical note. Have the child proceed independently.

Panel 2: Have the child proceed in the same way as in panel 1.

Panel 3: Have the child add or subtract.

Keeping Fit

Complete. Write > or <.

401 > 368	674 < 679	83 > 68
527 < 540	180 > 169	700 > 300
98 < 201	895 < 903	460 < 470
243 > 234	75 > 57	99 < 101

2. Write the missing numerals.

32	33	34	35	36	37
2	4	6	8	10	12
48	50	52	54	56	58
115	120	125	130	135	140
230	235	240	245	250	255
896	897	898	899	900	901
350	360	370	380	390	400
785	786	787	788	789	790

Using the Book Panel 1: You may wish to remind the child that when comparing three-digit numerals, first compare hundreds, then tens, then ones. Tell the child to write > or < in each ring to make a true sentence.

Panel 2: You may wish to guide the child through the first row. Elicit the idea that the pattern is counting by ones. Tell the child to find the pattern in each row, then write the missing numbers. Remind the child that each hand has a different sequence of numbers (the pattern does not continue from row to row).

OBJECTIVES

To review and maintain the following skills:

- To compare numbers having different hundreds [121]
- To compare numbers having the same hundreds [122]
- To count by ones [53, 120]
- To count by twos [60]
- To count by fives [123]
- To count by tens [124]

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

If children have unusual difficulty with the problems on this page, you could provide the necessary remedial work. Some are suggested below. The page references following the objectives are keyed to the lessons in which the concept is taught.

ACTIVITIES

Challenge the child to complete these number patterns:

115, 117, 119, ___, ___, ___, ___, ___, ___

342, 347, 352, ___, ___, ___, ___, ___

773, 783, 793, ___, ___, ___, ___

658, 659, ___, ___, ___, ___, ___

839, 838, ___, ___, ___, ___

428, 429, ___, ___, ___, ___

397, 398, ___, ___, ___, ___

596, 597, ___, ___, ___, ___.

OBJECTIVE

To evaluate achievement of the Chapter Objectives

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

The Chapter Test is designed to be used in a diagnostic manner. It assesses the child's knowledge of the main concepts and skills that were taught in this chapter. Some children should take this test independently with guidance for instructions only. Use judgment as to whether certain children should be guided through some or all of the exercises. Check each child's work and mark the items that are incorrect. Reteaching or extra practice might be necessary to help the child acquire the concept or skill that was missed. With this reteaching, you will be able to ascertain whether the child has then learned the topic in question. See Using the Book for page references indicating where the concept or skill was taught.

ACTIVITIES

1. Have the child use the Basic Fact Practice Card game in the Activity Reservoir for sums 11 through 14.

2. Conduct a "Math Bee" for practicing addition and subtraction sums 11 through 14. Use 2 teams. Each team takes turns. A teammate sits for a wrong answer. The team with the last person standing wins the "Bee."

3. Use the game Button Toss described in the Activity Reservoir for practice with 3 addends, sums through 14.

1. Add.

6 + 8 = 14	7 + 4 = 11	4 + 9 = 13	4 + 8 = 12	6 + 7 = 13	5 + 9 = 14
8 + 5 = 13	3 + 9 = 12	5 + 6 = 11	7 + 5 = 12	6 + 6 = 12	9 + 2 = 11

2. Subtract.

11 − 3 = 8	14 − 7 = 7	12 − 4 = 8	13 − 9 = 4	11 − 7 = 4	14 − 6 = 8
13 − 6 = 7	12 − 7 = 5	11 − 6 = 5	12 − 3 = 9	13 − 4 = 9	14 − 9 = 5

3. There were 14 crayons. There were 7 pencils. How many more crayons than pencils?

$$14 - 7 = 7$$

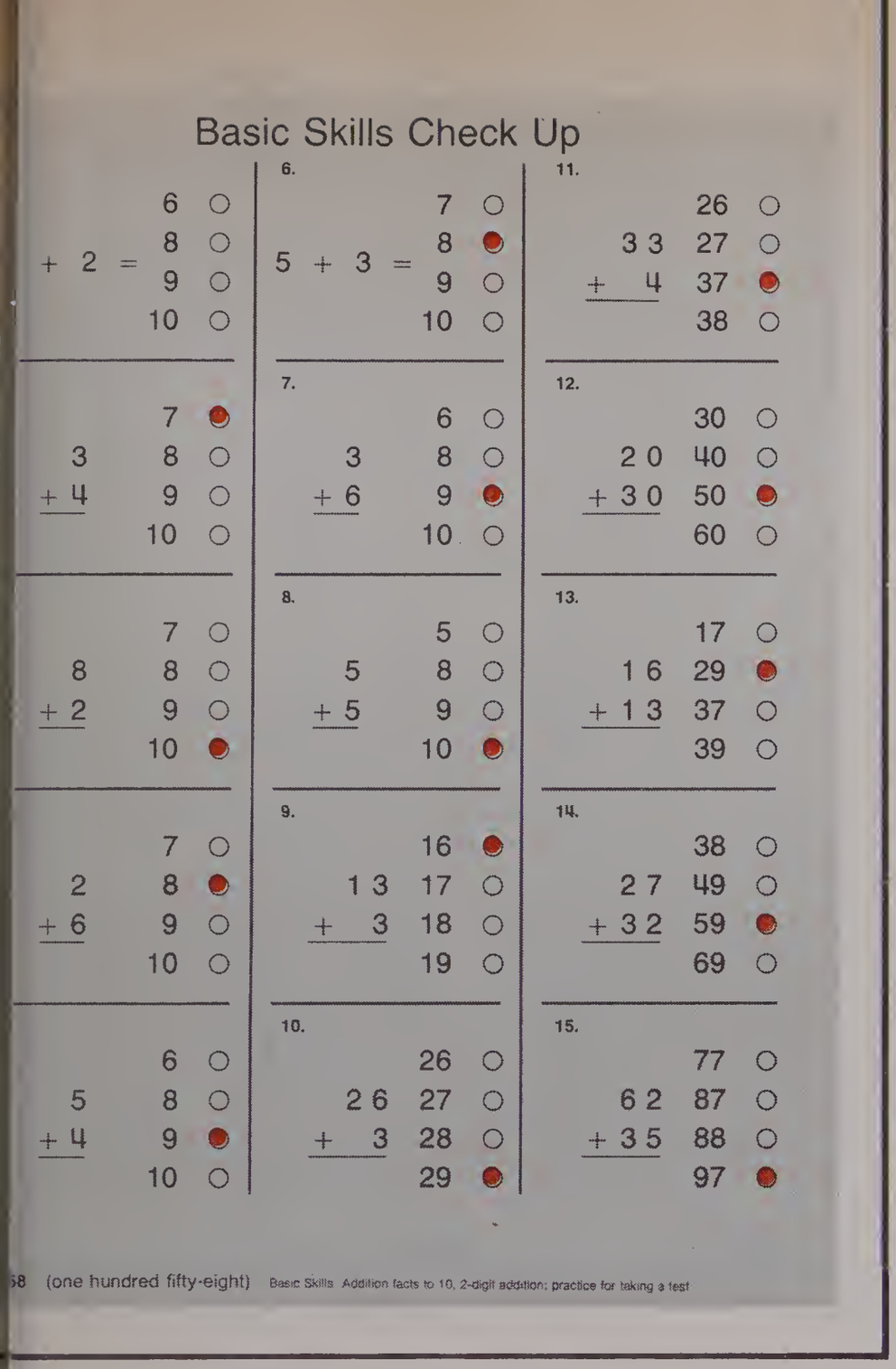
Chapter 8 Test (one hundred fifty-seven) 157

Using the Book This is a diagnostic test. The page references are given for reteaching as needed. The letter indicates the objectives.

Panel 1: Tell the child to add. [pages 137-140, A]

Panel 2: Tell the child to subtract. [pages 142-144, B]

Panel 3: Have the child read the problem and decide whether to add or subtract. Then write the addition or subtraction on the right and find the answer. [151, D]



Using the Book Panel 1: Direct the child to 7 plus 2. Ask, "7 plus 2 equals what number? (9)" Tell the child to look at the numbers to the right of the example. Have the child find the number 9. Say, "Look at the circle next to the 9. The circle that goes with the number 9 is filled in to show that this is the answer, 7 plus 2 equals 9." Have the child darken the circle over the grey screen.

Panel 2: Direct the child to 3 plus 4. Ask, "3 plus 4 equals what number? (7)" Tell the child to look at the numbers to the right. Have the child find the number. Say, "Fill in the circle next to the number 7 to show your answer. 3 plus 4 equals 7."

Panels 3-15: Have the child add and fill in the correct circle to show the answer. Make sure the child understands how to indicate the answer correctly. Then the child can proceed alone to finish the page. Some children may want to work out the answers on a separate sheet of paper.

OBJECTIVES

To add sums to 10
To add two digit numbers

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

The purpose of this page is to provide experience in the type of format that may be used on standardized tests, and so is an optional lesson. Some children may do this page independently with guidance for instructions only. Use judgement as to whether certain children should be guided through some or all of the exercises. On standardized tests at this grade level, all directions are oral. The "Using the Book" section gives guidance for administering this page. Notice that the circles for answers are all arranged vertically on these pages to give practice with this format. In filling in the circles make sure that the child presses down with the pencil to make a dark mark. Do not be concerned if the child does not fill in the circles exactly.

This page may be used in a diagnostic manner. Reteaching or extra practice may be necessary for those children who have difficulty with a particular skill. The chart below shows the page numbers where the skill was taught.

Skill	Page
Sum 10	105
Adding 2 digits	97

ACTIVITIES

Have children play Basic Fact Wheels as described in the Activity Reservoir. Use subtraction in vertical form from 10 or less.

Give the children oral practice in sums to 10. Call out an addition fact. Have the children take turns around the room giving the answers.

OBJECTIVES

To subtract from 10 or less
To subtract 2-digit numbers

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

The purpose of this page is to provide experience in the type of format that may be used on standardized tests, and so is an optional lesson. Some children may do this page independently with guidance for instructions only. Use judgement as to whether certain children should be guided through some or all of the exercises. On standardized tests at this grade level, all directions are oral. The "Using the Book" section gives guidance for administering this page. Notice that the circles for answers are all arranged vertically on these pages to give practice with this format. In filling in the circles make sure that the child presses down with the pencil to make a dark mark. Do not be concerned if the child does not fill in the circles exactly.

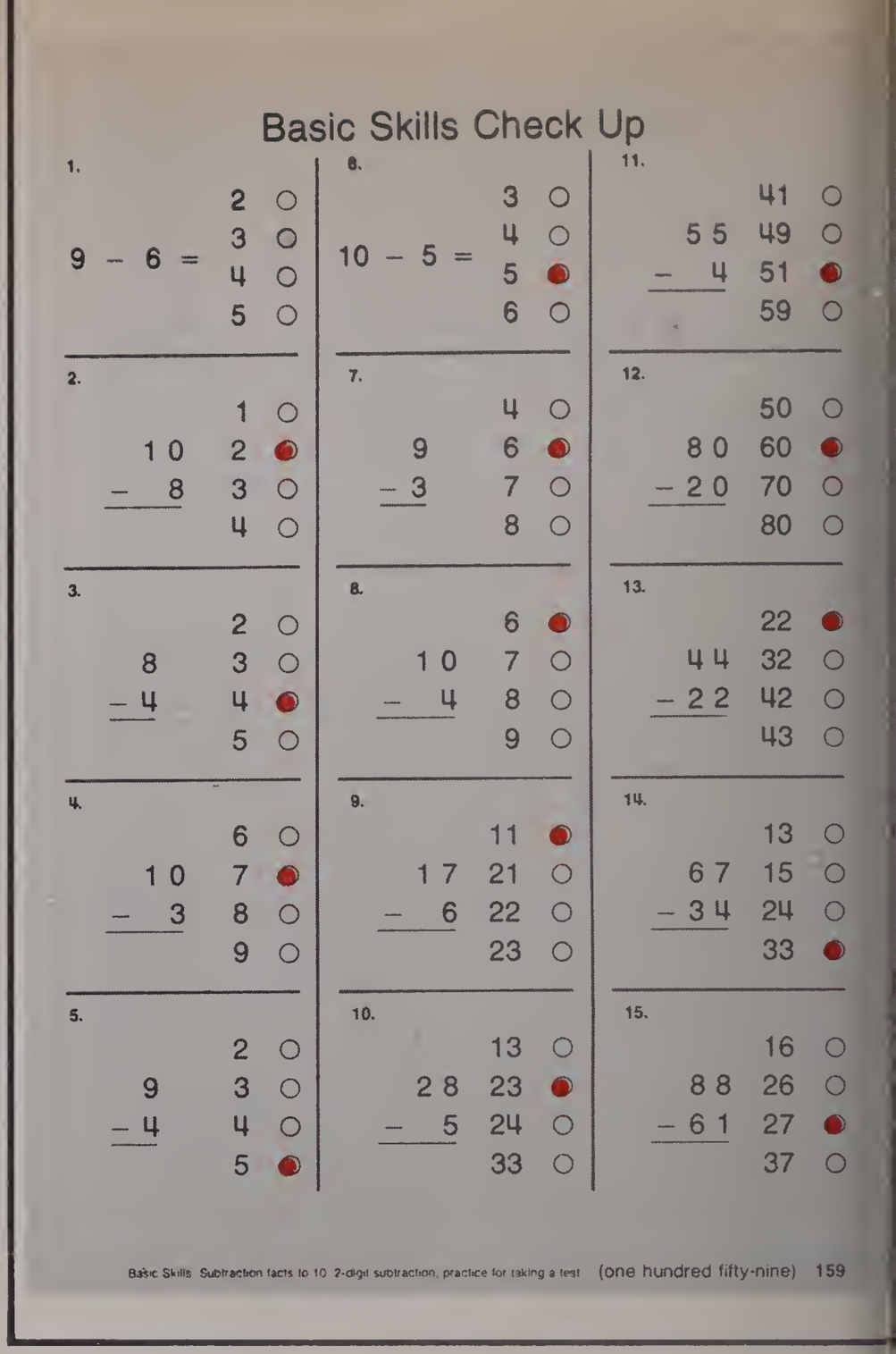
This page may be used in a diagnostic manner. Reteaching or extra practice may be necessary for those children who have difficulty with a particular skill. The chart below shows the page numbers where the skill was taught.

Skill	Page
Subtracting from 10	107
Subracting 2-digit numbers	102

ACTIVITIES

1. Have children play Basic Fact Wheels as described in the Activity Reservoir. Use subtraction in vertical form from 10 or less.

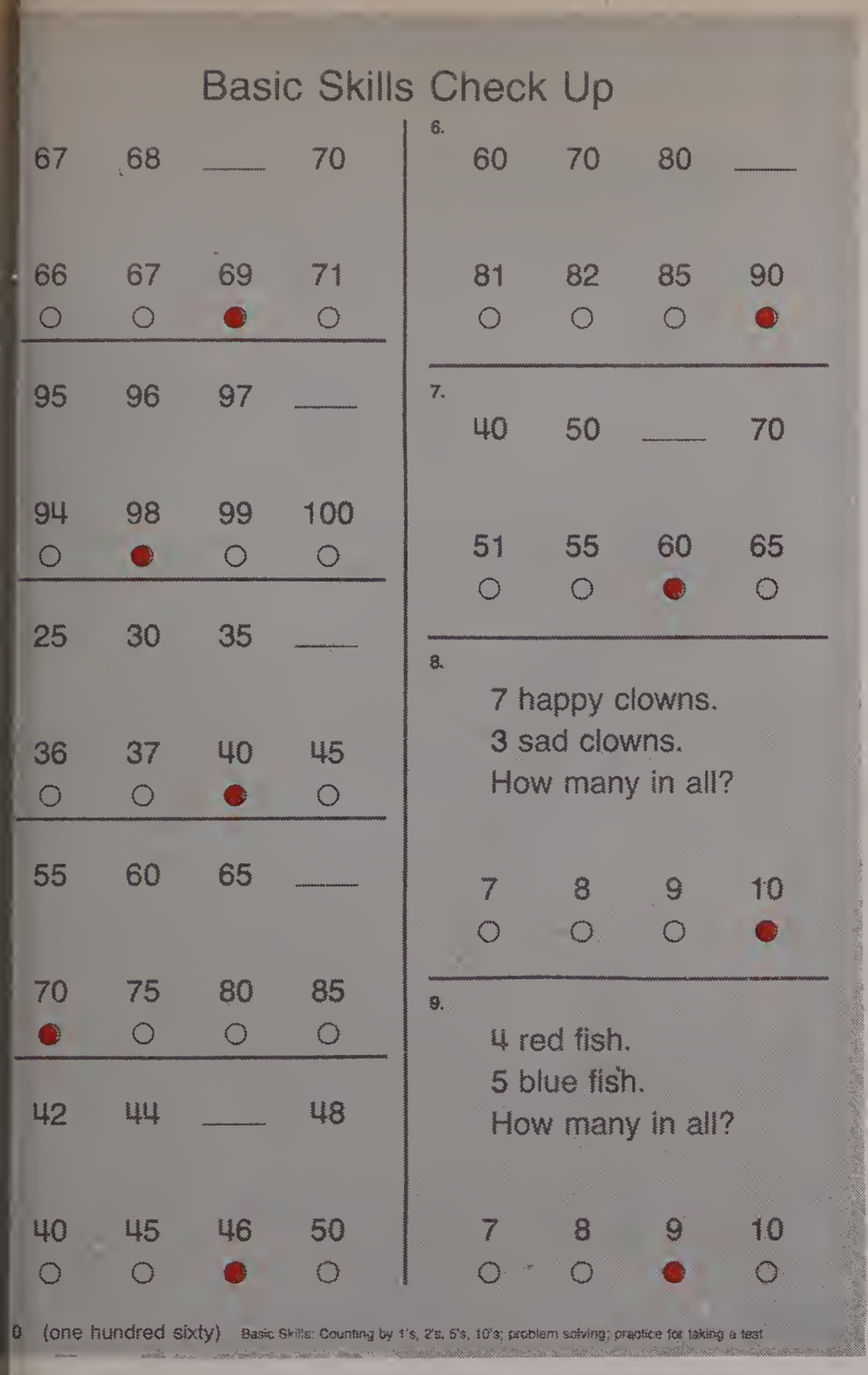
2. Have children play Concentration using 2-digit subtraction, no regrouping.



Using the Book Panel 1: Direct the child to 9 minus 6. Ask, "9 minus 6 equals what number? (3)" Tell the child to look at the numbers to the right of the example. Have the child find the number 3. Say, "Look at the circle next to the 3. The circle that goes with the number 3 is filled in to show that this is the answer, 9 minus 6 equals 3." Have the child darken the circle over the grey screen.

Panel 2: Direct the child to 10 minus 8. Ask, "10 minus 8 equals what number? (2)" Tell the child to look at the numbers to the right of the example. Have the child find the number 2. Say, "Fill in the circle next to the number 2 to show your answer. 10 minus 8 equals 2."

Panels 3–15: Have the child subtract and fill in the correct circle to show the answer. Make sure the child understands how to indicate the answer correctly. Then the child can proceed alone to finish the page. Some children may want to work out the answers on a separate sheet of paper.



Using the Book Panel 1: Direct the child to the number pattern. Tell the child, "We are going to count by ones." Read, "67, 68." Ask, "What number comes next? (69) Does 69 come after 68? (yes)." Make sure that each child verifies that 69 is the missing number. Say, "Look at the circle below 69. The circle that goes with the number 69 is filled in to show that this is the answer." Have the child darken the circle over the grey screen.

Panel 2: Have the child count by ones to find the missing number, and fill in the correct circle. Make sure the child understands how to indicate the answer correctly.

Panels 3-4: Have the child count by 5's to find the missing numbers.

Panel 5: Have the child count by 2's to find the missing number.

Panels 6-7: Have the child count by 10's to find the missing numbers.

Panels 8-9: Read the mini-problems to the child. Direct the child in finding the answers below and filling in the circles. Some children may want to work out the answers on a separate sheet of paper.

OBJECTIVES

To count by 1's, 2's, 5's, and 10's
To solve mini-problems

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

The purpose of this page is to provide experience in the type of format that may be used on standardized tests, and so is an optional lesson. Some children may do this page independently with guidance for instructions only. Use judgement as to whether certain children should be guided through some or all of the exercises. On standardized tests at this grade level, all directions are oral. The "Using the Book" section gives guidance for administering this page. Notice that the circles for answers are all arranged horizontally on these pages to give practice with this format. In filling in the circles make sure that the child presses down with the pencil to make a dark mark. Do not be concerned if the child does not fill in the circles exactly.

This page may be used in a diagnostic manner. Reteaching or extra practice may be necessary for those children who have difficulty with a particular skill. The chart below shows the page number where the skill was taught.

Skill	Page
counting by 5's	123
counting by 2's	60
problem solving	106
counting by tens	124

ACTIVITIES

Adapt the game Pop Up as described in the Activity Reservoir.

Have the children make up mini-problems using basic facts to 10. Then have them write the vertical form for each problem.

CHAPTER 9 OVERVIEW

The basic addition and subtraction facts for sums 15 through 18, along with addition and subtraction algorithms involving three-digit numerals, no regrouping, are introduced in this chapter.

The art theme for this chapter is Transportation.

OBJECTIVES

A To add hundreds, tens, and ones, no regrouping
B To subtract hundreds, tens, and ones, no regrouping
C To add tens and ones to hundreds, tens, and ones
D To subtract tens and ones from hundreds, tens and ones
E To add, sums 15 through 18
F To subtract from 15, 16, 17, and 18
G To solve problems involving three-digit numbers

BACKGROUND

1. We use sets of hundred-boxes, ten-boxes, and loose blocks to develop the procedures in the algorithm of addition involving three-digit numerals, no regrouping. It is reasonable to put loose blocks with loose blocks, ten-boxes with ten-boxes, and hundred-boxes with hundred-boxes. Hence we add ones, then tens, and then hundreds.

2. Similarly, if we want to take 253 blocks from 678 blocks, we take 3 blocks from 8 blocks, 5 ten-boxes from 7 ten-boxes, and 2 hundred-boxes from 6 hundred-boxes. This activity with blocks leads to the procedures in the subtraction algorithm, no regrouping; we subtract ones, then tens, and then hundreds.

The primary objective in training the child to add (or subtract) ones first, then tens, and then hundreds, is to develop a habit that will carry over into additions and subtractions with regrouping.

3. In question 4, page 171, the child encounters again the situation for subtracting "How many more are needed?" (See T.E. note for panel 2 page 151.) You may wish to add more questions of this type for practice.

MATERIALS

9 full hundred-boxes
10 full ten-boxes
18 blocks
bar graphs
pennies, nickels, dimes, quarters
addition table
addition practice cards: sums 13, 14, 15, and 16
mini-problems

CAREER AWARENESS

Pilots and Copilots [171]

Pilots and copilots fly airplanes that transport passengers and cargo. The pilot is in charge of the plane and the co-pilot is an assistant. Preflight planning involves checking the weather and choosing a route, speed, and altitude. Before taking off, the pilot and copilot check all the controls to make sure everything is working properly.

Many pilots and copilots work for large airline companies. Large corporations also hire pilots to fly company planes. Still others own small planes used for crop dusting, sightseeing, or private use.

It is important that children develop an awareness of self and others. Children should realize that pilots and copilots are responsible for the safety and well-being of the passengers. They must be concerned with the altitude, speed, ventilation, weather, etc. in respect to the passengers.

Photo description: Before take-off the pilot and copilot "preflight" the airplane. This includes checking the engines, controls, instruments, and other components to make sure everything is working properly.

BULLETIN BOARD

1. Transportation is a subject of great interest to many young children. The speed, noise, and pace of a subway station, for example, can be fascinating. The art theme for this chapter is transportation. It should be exciting for the children to help create a bulletin board around this theme. A child who has had an opportunity to visit a bus terminal (page 179) or an airport (page 167) might like to plan a mural for the class to draw based on his or her recollections.

2.

Add	hundreds	tens	ones	
	2	1	5	215
	1	4	3	+143
	3	5	8	358

Each teller should have 3 bags of play money ($100 dollar bills, $10 dollar bills, and $1 dollar bills). Several children may play at one time. One teller might give a child $345. The other teller might take $124 from the child as a "deposit." Have the child subtract to find how much money is left and count the play money to check.

A child may use the bulletin board independently by manipulating piles of money, counting it, and making up addition and subtraction problems.

SPECIAL NOTE

Color is used as an aid in visualizing the addition and subtraction operations for two-digit numbers. When hundred-boxes, ten-boxes and single blocks are used for illustrating addition, each addend is represented by a different color. For subtraction, all boxes and blocks are the same color.

OBJECTIVE

To add hundreds

PACING

Level A	All (1-2 guided)
Level B	All (1-2 guided)
Level C	All (1 guided)

MATERIALS

9 full hundred-boxes

BACKGROUND

See Item 1 in the Background of the Chapter Overview.

SUGGESTIONS

Initial Activity Show a set with 3 full hundred-boxes. Show another set with 2 full hundred-boxes. Ask the child to give the number of each set. Write the addition as in Panel 1. Have the child find the sum and then write the short form.

ACTIVITIES

1. Have the child write the three-digit numerals for 2 hundreds, 6 hundreds, and 9 hundreds.

2. Form 2 teams and line them up for a Math Bee Game. You state additions such as, "100 plus 200." Taking turns, a teammate must give the sum. If incorrect, he or she must sit. The team with no members left standing loses.

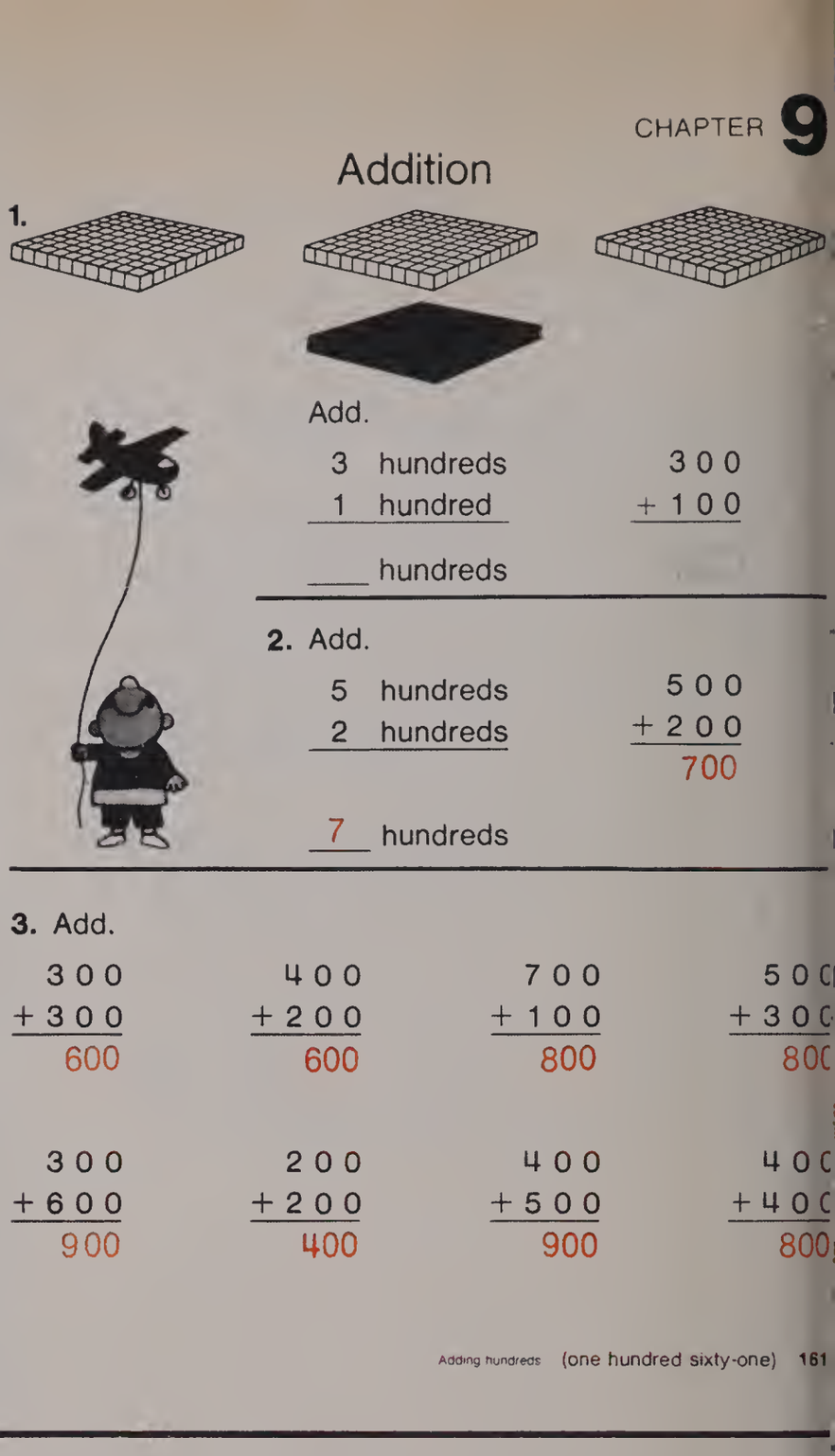
3. Challenge the child to find 3 addends in each row and each column in which each sum is 14. Provide 14 objects if needed. Example:

			14
			14
			14
14	14	14	14

6	4	4	14
3	3	8	14
5	7	2	14
14	14	14	

RELATED AIDS

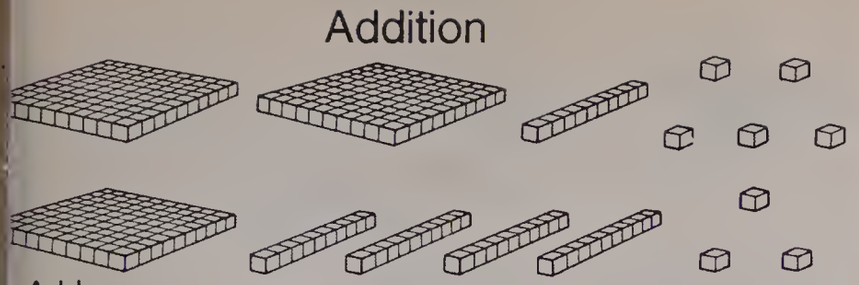
BFA COMP LAB I—23, 24.



Using the Book Panel 1: Ask the child to draw a ring around the yellow blocks, then draw a ring around the red blocks. Ask, "How many hundreds in the yellow set? (3) How many hundreds in the red set? (1) How many hundreds in all? (4)" Have the child look at the additions. The child may draw a mark from 3 hundreds to 300 and from 1 hundred to 100, then from 4 hundreds to 400 in order to relate the short form to the longer form. Explain that adding these numbers goes with joining the sets of hundred-boxes above. Have the child add and trace the answer in each form.

Panel 2: Tell the child to write the number of hundreds on the left and then find the sum on the right.

Panel 3: Have the child add.



Add.

hundreds	tens	ones
2	1	5
1	4	3

215
+ 143
358

320	452	203	317	542
+ 406	+ 137	+ 452	+ 231	+ 216
726	589	655	548	758
318	422	235	626	843
+ 321	+ 564	+ 411	+ 352	+ 123
639	986	646	978	966
244	532	741	512	436
+ 631	+ 235	+ 246	+ 275	+ 431
875	767	987	787	867
361	394	861	374	222
+ 425	+ 302	+ 125	+ 415	+ 333
786	696	986	789	555
426	831	656	703	542
+ 221	+ 147	+ 131	+ 191	+ 135
647	978	787	894	677

Using the Book Panel 1: Ask the child to give the numeral for the number of yellow blocks and trace this numeral in the place value chart, noting the columns where the digits are placed. Then have the child give the numeral for the number of green blocks and trace this numeral in the place value chart, noting the columns where the digits are placed. Tell the child to look at the addition on the left and add the ones, then the tens, then the hundreds. Then on the right, have the child trace the answers as they add ones, then tens, then hundreds, and then read the answer.

Panels 2-6: Tell the child to add, always beginning with the ones.

OBJECTIVE

To add hundreds, tens, and ones, no regrouping

PACING

Level A	All (1-2 guided)
Level B	All (1-2 guided)
Level C	All (1 guided)

MATERIALS

9 full hundred-boxes, 9 full ten-boxes, 9 blocks

SUGGESTIONS

Initial Activity Display a set with 252 blocks and a set with 324 blocks. Challenge the child to write the expanded numeral for each set and then find the sum. Use the blocks to check the answer. Guide the child in using the short form to add 252 and 324. Stress that we add ones and ones, then tens and tens, and then hundreds and hundreds.

ACTIVITIES

1. Play the game Stop the Magician, in the Activity Reservoir. Use adding and subtracting, sums 14 and less.

2. Two children may play this game. Make numeral cards for 312, 165, 403, 234, 122, 513, 320. Shuffle the cards. Each child draws 2 cards and adds the numbers on the cards. The child with the greater sum gets 1 point. Winner must get 5 points.

3. Play a "ring-toss" game. Collect 3 paper towel tubes. Paint one blue (100), one red (10), and one white (1) and fasten them in an upright position on a board. Cut out several cardboard rings. Have the child toss the rings. After the child computes the score, give the child a number to add to it.

RELATED AIDS

ACT. MASTERS—28.
BFA COMP LAB I—23, 24.
BFA PROB. SOLVING I—79, 81, 85, 91.

OBJECTIVE

To add tens and ones to hundreds, tens and ones

PACING

Level A (Initial Activities only)

Level B All (1–2 guided)

Level C All (1 guided)

MATERIALS

9 full hundred-boxes, 9 full ten-boxes, 9 blocks

SUGGESTIONS

Initial Activity Show a set with 324 yellow blocks and a set with 52 red blocks. Ask the child to give the expanded numeral for the number of blocks in each set. Write the expanded form, then write the short form. Have the child find the sum in each form. Then have the child compare each answer with the combined set of blocks. Say that we add ones first, then tens, then hundreds. Elicit that there are no hundreds in the second addend so we just bring down the hundreds from the first addend.

ACTIVITIES

1. Use basic fact cards to practice addition and subtraction facts, sums 9 and less.

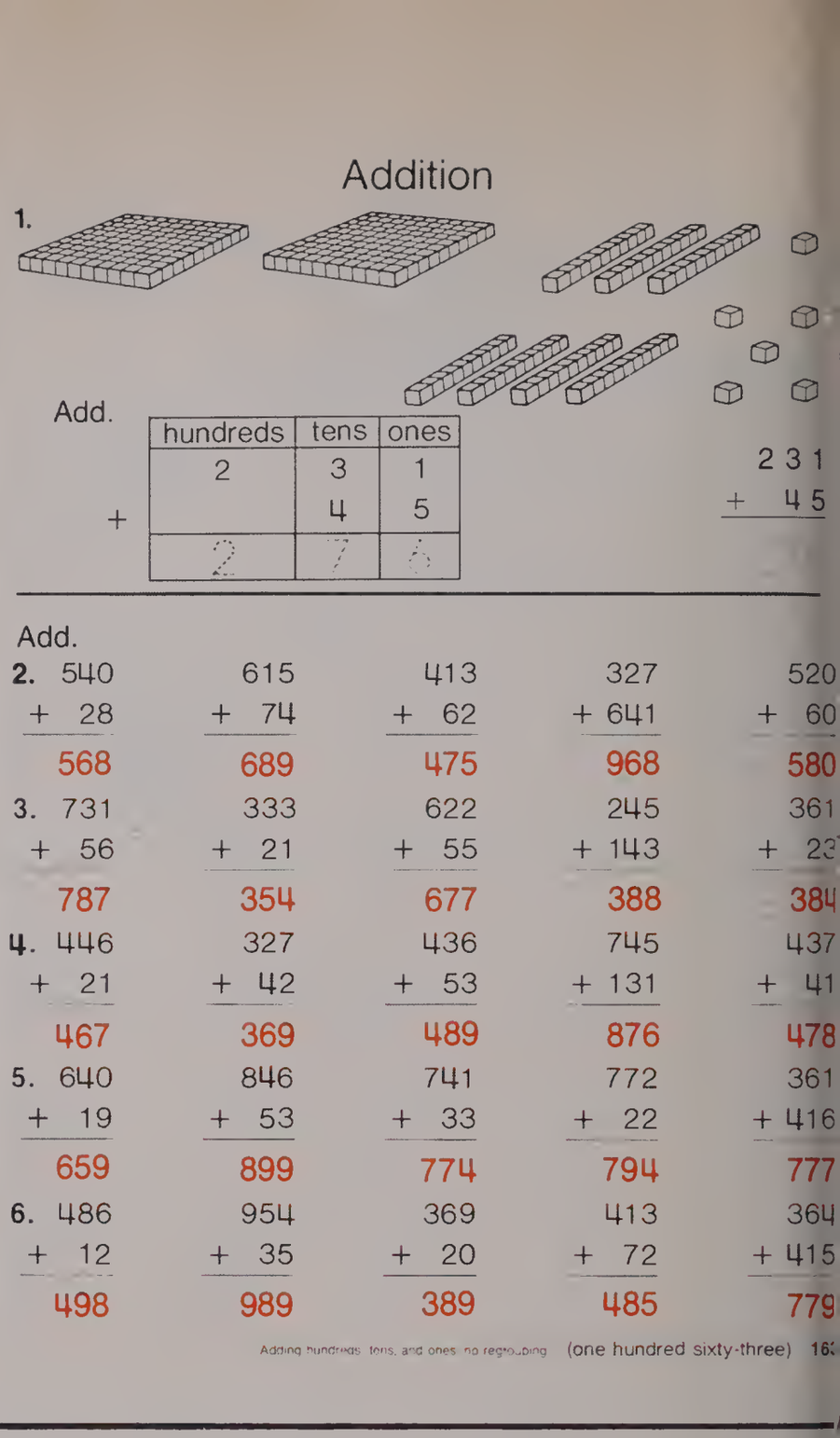
2. Play Bingo in the Activity Reservoir. Use sums 14 or less.

3. Challenge the child with abbreviated addition tables. (Answers are in italics.)

+	924	934	944	954	964	974
24	948	*958*	*968*	*978*	*988*	*998*

RELATED AIDS

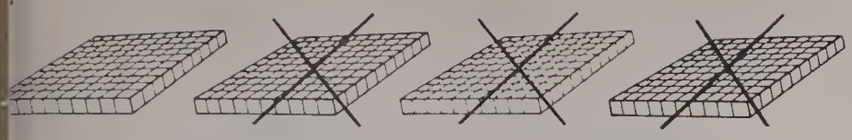
ACT. MASTERS—28.
BFA COMP LAB I—23, 24.
BFA PROB. SOLVING I—79, 81, 85, 91.



Using the Book Panel 1: Ask the child to give the numeral for the number of yellow blocks and trace this numeral in the place value chart, noting the columns where the digits are placed. Then have the child give the numeral for the number of red blocks and trace this numeral in the place value chart, noting the columns where the digits are placed. Tell the child we may add to find how many blocks there are in all. Point out the addition using the place value chart. Ask, "Are there any red hundred-boxes to put with the yellow hundred-boxes? (no) Are there any hundreds to add to the 2 hundreds? (no)" The child then verifies and traces the answer. Ask the child to name the addends in the short form. Then have the child verify the sum by adding ones, tens, and hundreds.

Panels 2-6: Tell the child to add. Stress that addition should begin with ones in each exercise.

Subtraction



Subtract.

4 hundreds	400
3 hundreds	−300
1 hundred	100

2. Subtract.

6 hundreds	600
2 hundreds	−200
4 hundreds	400

Subtract.

600	500	800	700
100	−400	−300	−400
500	100	500	300
900	800	700	900
700	−200	−500	−400
200	600	200	500

sing the Book Panel 1: Ask, "How many hundred-boxes are there in all?) How many are marked with an X? (3) How many are left? (1)" Have the ild read the subtraction on the left and pair the numbers with the short rm on the right. Explain that subtracting these numbers goes with separating e set of hundred-boxes above. Have the child subtract and trace the answer each form.

Panel 2: Have the child complete the subtraction on the left first. Then ve the child find the difference on the right.

Panel 3: Tell the child to subtract.

OBJECTIVE

To subtract hundreds

PACING

Level A	All (1-2 guided)
Level B	All (1-2 guided)
Level C	All (1 guided)

MATERIALS

7 full hundred-boxes

BACKGROUND

See Item 2 in Background of the Chapter Overview.

SUGGESTIONS

Initial Activity You might display a set of 7 full hundred-boxes. Instruct the child to take away 3 hundred-boxes. Write the expanded form, as in Panel 1, for this subtraction. Encourage the child to relate the subtraction to the blocks and give the answer. Guide the child in writing the short form using three-digit numerals and giving the answer.

ACTIVITIES

1. Have one child read subtraction exercises while other children write the exercise and solve at the chalkboard.

2. The child might enjoy an oral drill on subtracting hundreds. Adapt the Math Bee described in the Activity on page 161.

3. Write exercises such as 300 + 200 + 100 in vertical form. Challenge the child to find the sums.

RELATED AIDS

ACT. MASTERS—28.
BFA COMP LAB I—52-54, 66, 67.

OBJECTIVE

To subtract hundreds, tens, and ones, no regrouping

PACING

Level A All (1-2 guided)

Level B All (1-2 guided)

Level C All (1 guided)

MATERIALS

9 full hundred-boxes, 9 full ten-boxes
9 blocks

SUGGESTIONS

Initial Activity Display a set of 658 blocks. Challenge the child to write the expanded numeral and the three-digit numeral for the number of blocks. Say, "Take away 135 blocks." Write the expanded form for the subtraction of 135 from 658. Then relate the subtraction to an activity with the blocks. Stress the idea that we first subtract ones from ones, then tens from tens, and then hundreds from hundreds. Guide the child in using the short form to find the answer.

ACTIVITIES

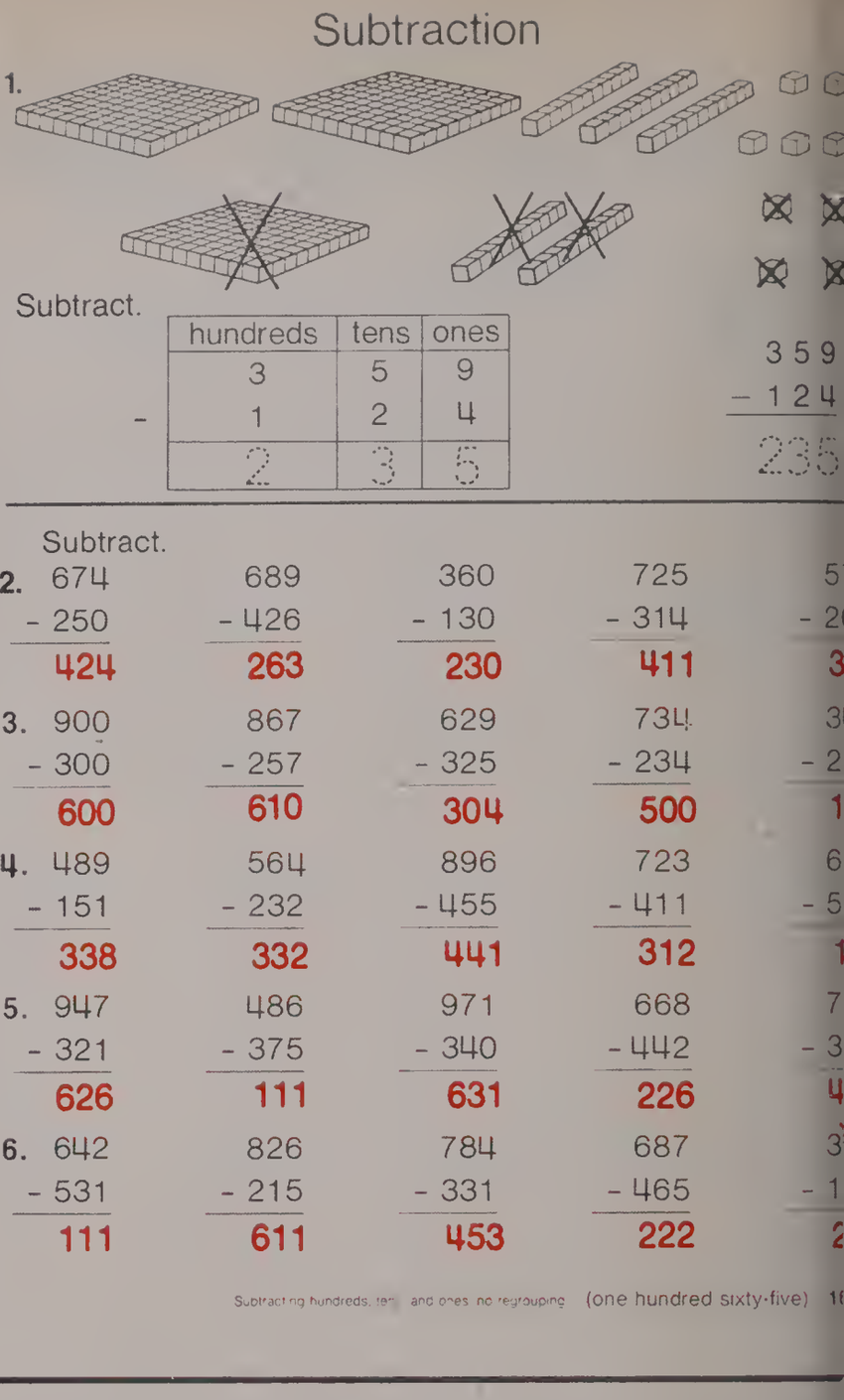
1. Give the child oral practice, adding and subtracting, sum 14.

2. Make a set of numeral cards for 5, 6, 7, 8, and 9. Make a second set for 11, 12, 13, and 14. Place the first set on the floor to look like a path. Give the child one of the cards from the second set. Have the child walk the path. As the child steps on a block (numeral), the child must subtract that number from the number he or she is holding.

3. Challenge the child to create and solve mini-problems. For example: "325 red birds. 460 blue birds. How many birds in all?"

RELATED AIDS

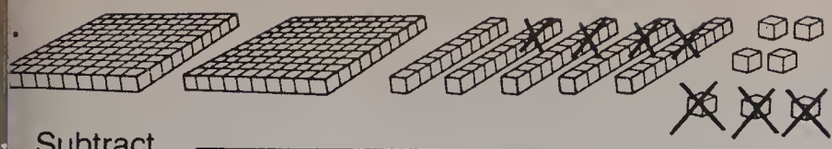
ACT. MASTERS—28.
BFA COMP LAB I—52-54, 66, 67.
BFA PROB. SOLVING LAB I—80, 81, 86, 92.



Using the Book Panel 1: Ask the child to give the numeral for the number of blocks in all and trace this numeral in the place value chart, noting the columns where the digits are placed. Then touch that numeral in the long form. Then ask the child to give the numeral for the number of blocks marked out with X's and trace this numeral in the place value chart, noting the columns where the digits are placed. Touch that numeral in the long form. Have the child subtract the ones, then tens, then hundreds. The child may check the answer with the unmarked blocks. Relate the short form to the long form and have the child subtract beginning with ones. You may stress place value by having the child say: "Subtract four ones from nine ones and that leaves five ones" and so on.

Panels 2-6: Tell the child to subtract, beginning with ones.

Subtraction



Subtract.

	hundreds	tens	ones
	2	5	7
−		4	3
	2	1	4

$$\begin{array}{r} 257 \\ -\ 43 \\ \hline 214 \end{array}$$

Subtract.

. 482	578	986	754	291
− 52	− 36	− 54	− 34	− 60
430	542	932	720	231
. 375	700	428	628	796
− 42	− 500	− 16	− 15	− 63
333	200	412	613	733
. 168	273	394	486	362
− 45	− 32	− 71	− 45	− 140
123	241	323	441	222
. 658	496	149	437	584
− 36	− 65	− 27	− 123	− 72
622	431	122	314	512
. 648	247	698	449	847
− 234	− 15	− 73	− 35	− 25
414	232	625	414	822

sing the Book Panel 1: Tell the child to name the numeral for the number f blocks in all and trace this numeral in the place value chart, noting the olumns where the digits are placed. Ask, "What is the numeral for the number f blocks marked with X's and trace this numeral in the place value chart, oting the columns where the digits are placed. (4 tens plus 3) Are there any undreds to subtract from the 2 hundreds? (no)" Then have the child verify ie difference in the long form, beginning with ones and then trace the nswer. Then the child should verify the answer in the short form as the nswer is traced.

Panels 2-6: Tell the child to subtract, beginning with ones.

OBJECTIVE

To subtract tens and ones from hundreds, tens, and ones, no regrouping

PACING

Level A (Initial Activities only)

Level B All (1–2 guided)

Level C All (1 guided)

MATERIALS

9 full hundred-boxes, 9 full ten-boxes, and 9 blocks

SUGGESTIONS

Initial Activity Show a set of 548 blocks. Ask the child to give the expanded numeral for the number of blocks. Say, "We are to remove 36 blocks." Write the subtraction in the long form as in Panel 1, page 166. Subtract ones first, then tens, then hundreds. Ask, "Are there any hundreds to subtract from 5 hundreds? (no)" Have the child take 36 blocks from the set and compare the remaining blocks with the answer. Guide the child in writing the short form and subtracting. Stress that we subtract ones first.

ACTIVITIES

1. Play Bingo. (See Activity Reservoir.) Use sums 12-14.

2. For sums through 14, use the Basic Fact Wheels in Activity Reservoir.

3. Complete Bulletin Board suggestion 2 in the Chapter Overview.

4. The child should enjoy a subtraction table. (Answers are in italics.)

−	687	677	667	657	647	637
32	655	*645*	*635*	*625*	*615*	*605*

RELATED AIDS

ACT. MASTERS—28.
BFA COMP LAB I—52-54, 66, 67.
BFA PROB. SOLVING LAB I—80, 81, 86, 92.

OBJECTIVE

To solve word problems

PACING

Level A All (1–2 guided)

Level B All (1 guided)

Level C All

SUGGESTIONS

Initial Activity The child might enjoy discussing airports. Try to encourage the child to create word problems during the discussion. (It is immaterial whether or not problems involve three-digit numerals.)

Write problems similar to those on page 167. For each problem, ask the child to read the problem, then tell whether to add or subtract. Then challenge the child to write the addition or subtraction in the short form and find the answer.

Inspire a discussion on the consumer aspects of this page—air and noise pollution. Discuss why this is bad.

ACTIVITIES

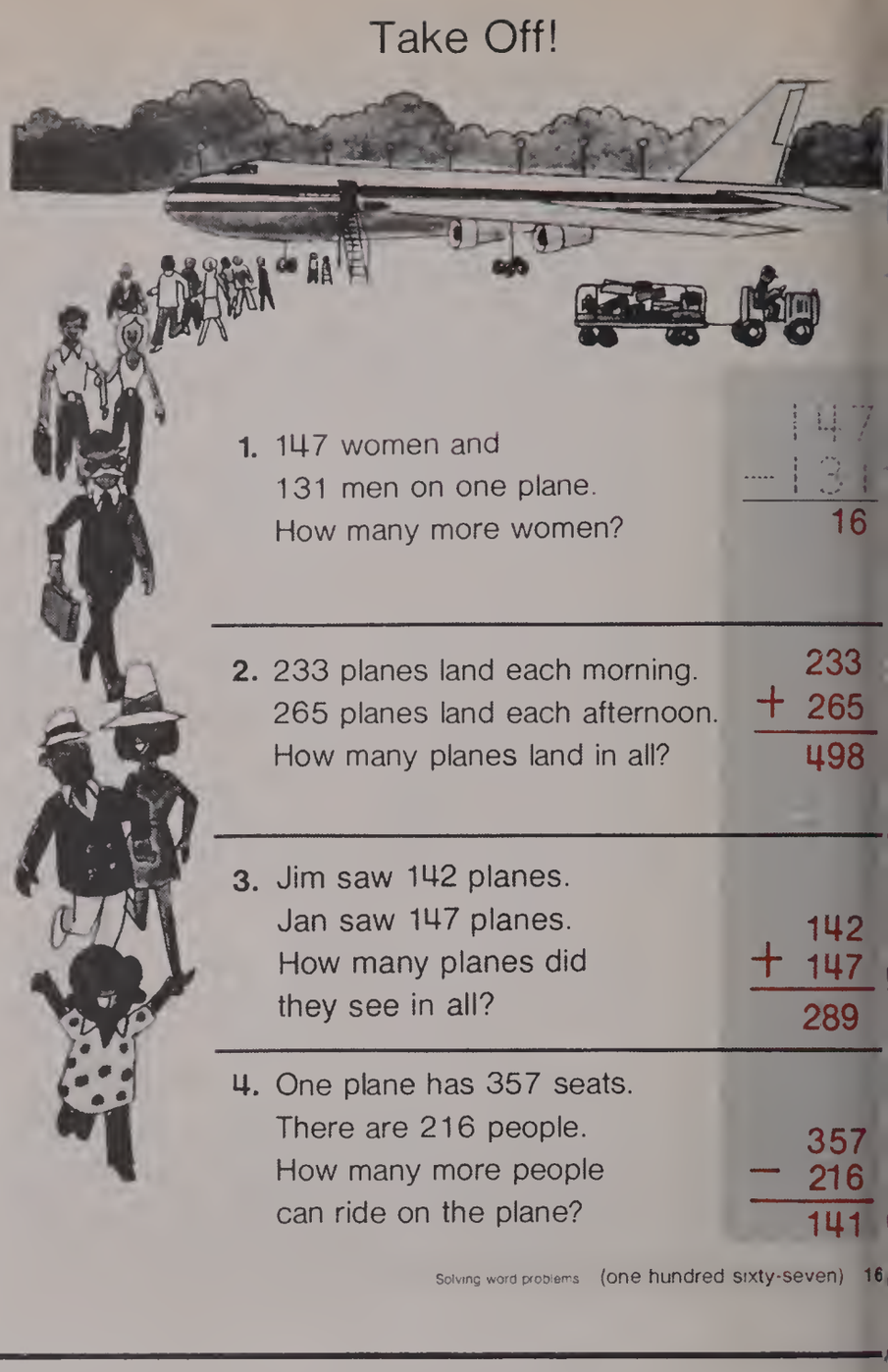
1. Have the child read and work problems from the worktable.

2. Two children may play a guessing game. The children take turns. One writes a three-digit numeral. The other child asks questions until the answers reveal that numeral. For example, the first child writes 527 and the second child asks: "Is one of the digits 3? (no) Is one digit 5? (yes) Is 5 in the tens place? (no) Is 5 in the hundreds place? (yes)" and so on until the second child has enough information to write the numeral. The child's score is the number of questions asked. The low score wins.

3. Adapt the guessing game above. Use teams. Allow each team 1 min to score (guess an answer). The higher score wins.

RELATED AIDS

BFA PROB. SOLVING I—70-72, 76, 77, 79-96.



Using the Book Have the child look at the picture at the top of the page. Ask if the child has ever been on an airplane. If so, you may wish to have the child relate experiences at the airport.

Panel 1: Have the child read the problem. Direct the child to the subtraction on the right. Have the child relate the numbers to the word problem and tell why it is a subtraction. Tell the child to find the difference.

Panels 2–4: Have the child read the problems and write an addition or subtraction on the right. Then find the answers.

Sums Fifteen and Sixteen

dd.

$$\begin{array}{r} 9 \\ +\ 6 \\ \hline \end{array}$$

2.

$$\begin{array}{r} 6 \\ +\ 9 \\ \hline 15 \end{array}$$

9 + 7 = 16	7 + 9 = 16	4. 9 + 6 = 15	6 + 9 = 15	5. 8 + 7 = 15	7 + 8 = 15
8 + 8 = 16	6 + 9 = 15	7 + 8 = 15	9 + 6 = 15	7 + 9 = 16	9 + 6 = 15
4 5 + 7 = 16	6 2 + 8 = 16	3 4 + 8 = 15	2 4 + 9 = 15	5 2 + 8 = 15	5 5 + 5 = 15
3 3 + 9 = 15	3 5 + 7 = 15	6 4 + 5 = 15	4 4 + 7 = 15	1 6 + 9 = 16	7 2 + 6 = 15
1 5 + 9 = 15	3 7 + 5 = 15	6 1 + 8 = 15	3 6 + 7 = 16	3 6 + 6 = 15	7 2 + 7 = 16

sing the Book Panel 1: Relate the addition to the picture by telling a story: Louise has 9 red apples and 6 green apples. How many apples does she have in ? (15) Nine plus 6 is what number?" Have the child trace 15.

Panel 2: Follow procedures similar to those for panel 1. Point out that though the order of addends is changed, the sum remains the same.

Panels 3-9: Tell the child to add.

OBJECTIVE

To add, sums 15 and 16, in vertical form

PACING

Level A	All (1-5 guided)
Level B	All (1-5 guided)
Level C	All (1-3 guided)

MATERIALS

16 blocks, addition practice cards: sums 13, 14, 15, and 16

SUGGESTIONS

Initial Activities 1. Give the child 15 blocks. Have the child show a set of 8 blocks and a set of 7 blocks. Ask the child how many blocks in all. Repeat with other examples.

2. Shuffle the addition practice cards for sums 13 through 16 and place them on the chalkrail. Have the child pair the cards to show the order property of addition and then give the sum for each pair.

EXTRA PRACTICE

Write these on the chalkboard. Ask students to put answers with each.

1.	2 + 5 + 9 =	3 + 8 + 5 =	7 + 4 + 5 =	6 + 1 + 9 =	10 + 3 + 3 =
2.	8 + 2 + 5 =	12 + 2 + 1 =	11 + 4 + 1 =	6 + 3 + 6 =	7 + 3 + 5 =
3.	5 + 5 + 5 =	3 + 6 + 6 =	4 + 4 + 4 =	3 + 3 + 7 =	7 + 7 + 2 =

RELATED AIDS

ACT. MASTERS—18, 24, 25.
—Gen. Use 7-9, 13.
BFA PROB. SOLVING I—61.

OBJECTIVE

To add, sums 17 and 18, in vertical form

PACING

Level A	169 All (1-4 guided) 170 All
Level B	169 All (1-4 guided) 170 All
Level C	169 All (1-3 guided) 170 All

MATERIALS

18 blocks

SUGGESTIONS

Initial Activities 1. Show a set of 9 blocks and a set of 8 blocks. Ask the child how many blocks in all?

2. Adapt the above procedures to develop the vertical addition facts:

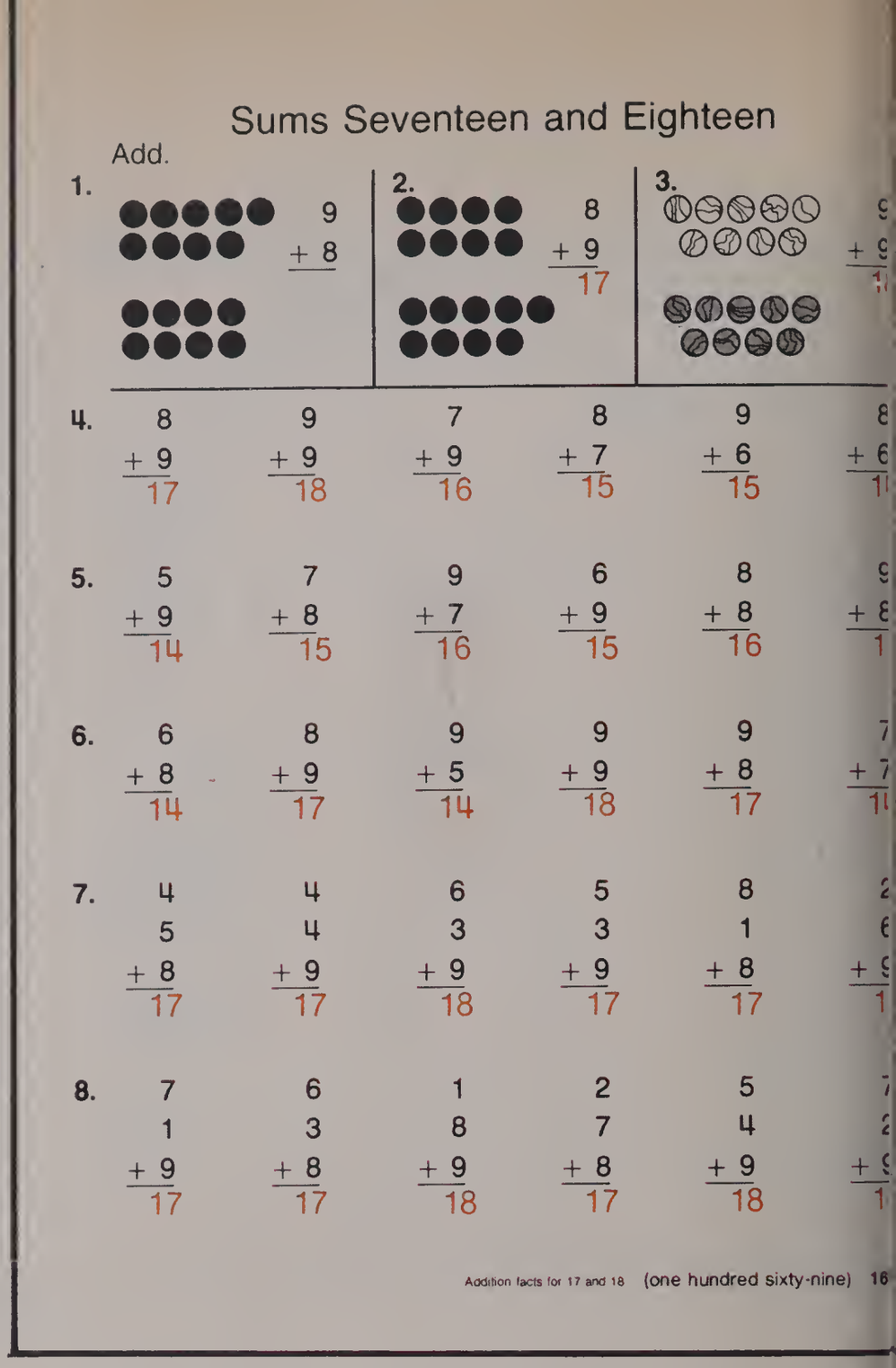
$$\begin{array}{r} 8 \\ +\ 9 \\ \hline 17 \end{array} \qquad \begin{array}{r} 9 \\ +\ 9 \\ \hline 18 \end{array}$$

ACTIVITIES

1. Arrange 6 boxes (cut-off milk cartons) with numerals 13 through 18 on them. Have the child sort addition practice cards in the box that has the numeral for the sum on it.

2. Provide oral drill on addition facts to 18. Have the child write the addition on the chalkboard and then give the sum.

3. Have the child play Bingo, as described in the Activity Reservoir. Use addition facts to 18 in each cell.



Sums Seventeen and Eighteen

Add.

1. 9 + 8 = 17
2. 8 + 9 = 17
3. 9 + 9 = 18

4.	8 + 9 = 17	9 + 9 = 18	7 + 9 = 16	8 + 7 = 15	9 + 6 = 15
5.	5 + 9 = 14	7 + 8 = 15	9 + 7 = 16	6 + 9 = 15	8 + 8 = 16
6.	6 + 8 = 14	8 + 9 = 17	9 + 5 = 14	9 + 9 = 18	9 + 8 = 17
7.	4 + 5 + 8 = 17	4 + 4 + 9 = 17	6 + 3 + 9 = 18	5 + 3 + 9 = 17	8 + 1 + 8 = 17
8.	7 + 1 + 9 = 17	6 + 3 + 8 = 17	1 + 8 + 9 = 18	2 + 7 + 8 = 17	5 + 4 + 9 = 18

Using the Book Panel 1: Relate the addition to the picture by telling a story: "June had 9 blue marbles. She won 8 red marbles. How many marbles does she have in all? (17) Nine plus 8 is what number?" Have the child trace 17.

Panel 2: Use procedures similar to panel 1. Point out that although the order of the addends has changed, the sum remains the same.

Panel 3: Use procedures similar to panel 1.

Panels 4-8: Tell the child to add.

dd.

9 + 5 = 14	6 + 7 = 13	6 + 8 = 14	8 + 4 = 12	3 + 9 = 12	9 + 9 = 18
2 + 9 = 11	9 + 6 = 15	3 + 8 = 11	6 + 6 = 12	8 + 1 = 9	4 + 8 = 12
6 + 9 = 15	9 + 4 = 13	5 + 9 = 14	9 + 8 = 17	7 + 3 = 10	5 + 7 = 12
9 + 2 = 11	8 + 7 = 15	9 + 9 = 18		8 + 3 = 11	9 + 1 = 10
7 + 4 = 11	8 + 9 = 17	7 + 8 = 15		7 + 7 = 14	5 + 5 = 10
9 + 8 = 17	7 + 5 = 12	6 + 4 = 10		7 + 6 = 13	5 + 8 = 13
4 + 7 = 11	9 + 3 = 12	6 + 5 = 11	8 + 5 = 13	9 + 7 = 16	8 + 9 = 17
9 + 0 = 9	8 + 6 = 14	4 + 9 = 13	8 + 2 = 10	8 + 8 = 16	7 + 9 = 16

0 (one hundred seventy) Practice, addition facts to 18

AT HOME: Read some of the exercises and have the child give the answers. Say, "What is 9 plus 5?" and so on.

Using the Book Panels 1–8: Tell the child to add.

At Home After finishing the pupil page, the child may take it home and complete the At Home activity at the bottom of the page.

ACTIVITIES

1. Duplicate a worksheet with addition problems to 18 on the left-hand side and answers (in random order) on the right-hand side. Have the child match the correct answer to each problem.

2. Use Basic Fact Practice Cards for sums through 18. See Activity Reservoir.

3. Two children (or 2 teams) may play a guessing game. Provide addition practice cards, vertical form, for sums 11-18 with the sum for each card shown on the back of the card. One child holds up a card, say with 13 on the back. The back of the card is turned toward the second child. The first child says, "I see two numbers, one is 7. You see the sum. What is the other number?"

EXTRA PRACTICE

Practice Exercises p. 256 (top)

Tell the child to add.

1.	9 + 7 = 16	8 + 5 = 13	5 + 9 = 14	3 + 8 = 11	8 + 4 = 12
2.	8 + 9 = 17	6 + 7 = 13	8 + 6 = 14	9 + 9 = 18	7 + 9 = 16
3.	4 + 9 = 13	6 + 6 = 12	2 + 9 = 11	6 + 4 = 10	9 + 6 = 15
4.	8 + 7 = 15	3 + 9 = 12	8 + 8 = 16	9 + 8 = 17	3 + 7 = 10
5.	6 + 9 = 15	7 + 7 = 14	4 + 7 = 11	7 + 8 = 15	5 + 7 = 12

RELATED AIDS

ACT. MASTERS—18, 24, 25, 29.
—Gen. Use 7-9, 13.
BFA COMP LAB I—10, 11.
BFA PROB. SOLVING I—61.

OBJECTIVE

To solve mini-problems

PACING

Level A All (guided)

Level B All (1 guided)

Level C All (1 guided)

SUGGESTIONS

Initial Activities 1. The career for this page is pilots and copilots. See Chapter Overview. Have the child discuss any experiences with airplanes, pilots, and/or airports and create mini-problems.

2. Write problems similar to those on page 171. For each problem, ask the child whether to add or subtract. Then have the child write the addition or subtraction in the short form and find the answer.

ACTIVITIES

1. Have the child cut out pictures of airplanes from catalogues, magazines, and newspapers. If possible, have the child label its name such as 747 jet, etc. Display. Challenge the child to tell a story about his or her pictures.

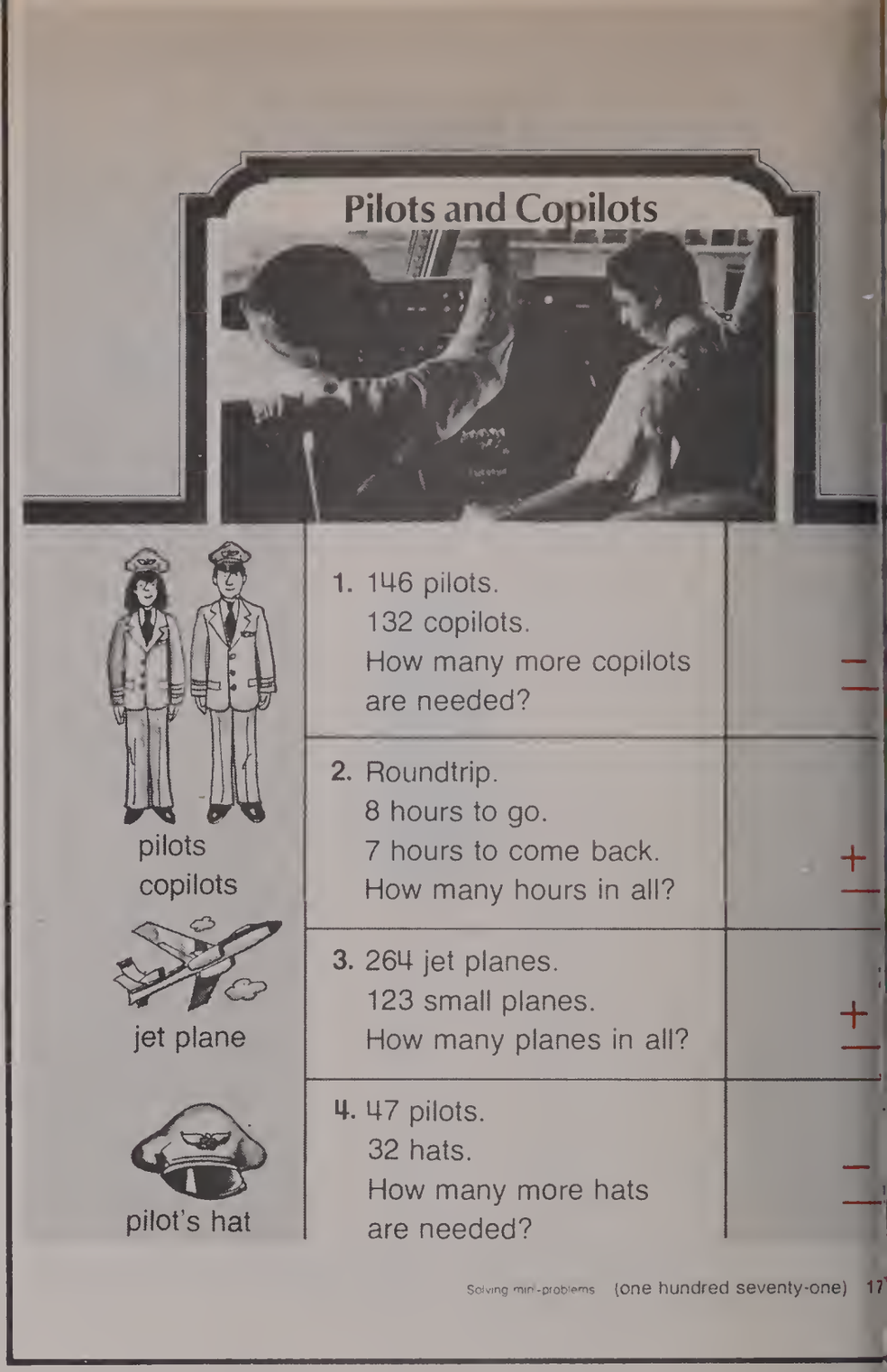
2. Have a group of children find and cut out pictures of various types of aircraft (jets, private planes, helicopters, marine planes, etc.), pilots, and/or airports and make a poster display of an airport. Below the poster, have a child complete phrases such as 7 airplanes, 3 pilots, etc.

3. Provide colored construction paper. Encourage the child to make a model plane, name it, and write a mini-problem about it.

4. Provide children (groups of 3) with various pieces of colored construction paper, paste, and string. Have the children make model airplanes and then make a mobile (hanging construction) using their models.

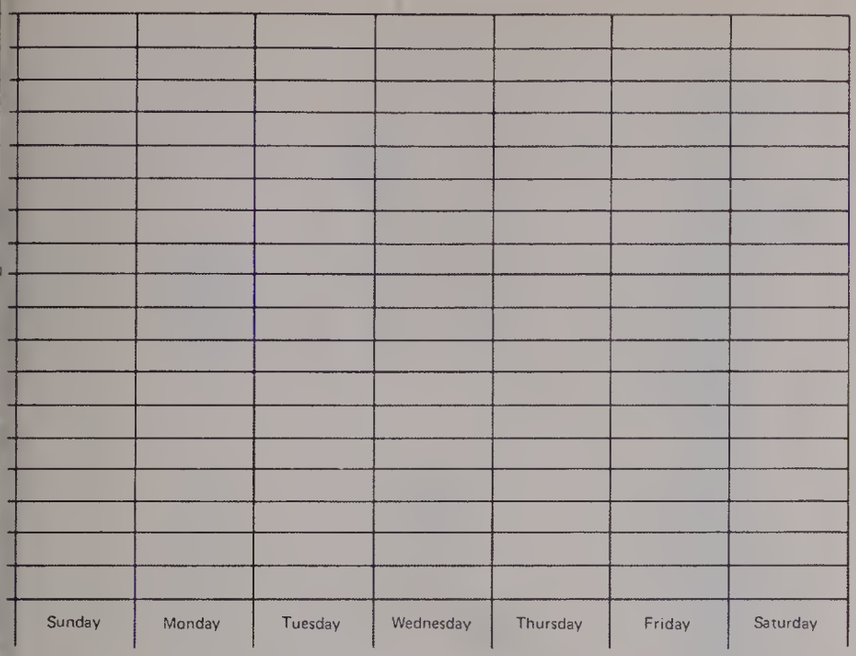
RELATED AIDS

BFA PROB. SOLVING I—70-72, 76, 77, 79-96.



Panels 1-4: Assist the child in reading the problems. Then provide assistance on those problems for which there is some question about the child's understanding. See note 3 in Background.

Happy Birthday!



1. How many more birthdays on Monday than on Sunday? **Answers may vary.** ____
2. How many more birthdays on Wednesday than on Thursday? ____
3. How many more birthdays on Friday than on Saturday? ____
4. How many birthdays in all on Monday and Tuesday? ____
5. How many birthdays in all on Thursday and Saturday? ____

Using the Book This is an activity page. Have each child tell, for the current year, on which day of the week his or her birthday falls. Determine how many birthdays fall on each weekday. Have the child colour the appropriate number of cells for each weekday, using a different colour for each weekday. Then have the child answer the questions.

Questions 1-5: Have the child read the question. Explain that the child must look at the graph to find the necessary information. You may ask, for example, "How many birthdays are on Monday? On Sunday? Which day shows more birthdays, Monday or Sunday? How many more? Should you add or subtract?" Have the child write the answer in the blank. If necessary, the child may write the computation on a separate sheet of paper.

OBJECTIVES

To make and read vertical bar graphs
To solve problems

PACING

Level A (Initial Activities only)

Level B All (1-2 guided)

Level C All (1 guided)

SUGGESTIONS

Initial Activity Draw a vertical bar graph similar to the one on page 172. Assist the child in choosing a topic related to the calendar and making a graph. Guide the child in filling the graph and encourage the child to tell the other children about the information shown on it.

ACTIVITIES

1. The child might benefit from discussion on the calendar for the current year. Review the number of months in a year and their names, the number of days in a week and their names, etc.

2. Ask the child to look for a graph similar to that on page 172. Tell the child to look in newspapers and magazines, especially business magazines. Have the child bring the graph to class and interpret it to the class.

3. Furnish the child with a grid to make a graph. Have the child collect information about the month of their classmates' birthdays, then graph it.

4. Encourage the child to select some information that can be graphed. Challenge the child to graph the information and interpret it to the class.

RELATED AIDS

ACT. MASTERS—30, 31.

OBJECTIVE

To complete an addition table

PACING

Level A	All (1 guided)
Level B	All (1 guided)
Level C	All (1 guided)

MATERIALS

an addition table

SUGGESTIONS

Initial Activity Review working with an addition table. Prepare a grid like this:

+	4	7	9	6	8
6	*10*	*13*	*15*	*12*	*14*
8	*12*	*15*	*17*	*14*	*16*
5	*9*	*12*	*14*	*11*	*13*
7	*11*	*14*	*16*	*13*	*15*

The procedure in finding each sum is the same as on page 173. The first addend is on the left and the second is on the top row.

ACTIVITIES

1. Use the Domino game described in the Activity Reservoir, for practicing sums through 18.

2. Use the Basic Facts Practice Cards described in the Activity Reservoir, for sums through 18.

3. Play the Ladder game in the Activity Reservoir. Use sums through 18.

RELATED AIDS

ACT. MASTERS—18, 24, 25, 29.
—Gen. Use 7-9, 13.
BFA COMP LAB I—10, 11.
BFA PROB. SOLVING I—61.

Addition Table

1.

+	0	1	2	3	4	5	6	7	8	9
0	0	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9	10
2	2	3	4	5	6	7	8	9	10	11
3	3	4	5	6	7	8	9	10	11	12
4	4	5	6	7	8	9	10	11	12	13
5	5	6	7	8	9	10	11	12	13	14
6	6	7	8	9	10	11	12	13	14	15
7	7	8	9	10	11	12	13	14	15	16
8	8	9	10	11	12	13	14	15	16	17
9	9	10	11	12	13	14	15	16	17	18

2. Add.

1 + 4 = 5	3 + 6 = 9	6 + 3 = 9	6 + 6 = 12	7 + 5 = 12
7 + 7 = 14	6 + 9 = 15	8 + 8 = 16	9 + 8 = 17	7 + 9 = 16

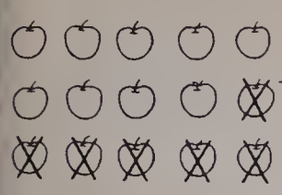
Using the addition table sums 18 (one hundred seventy-three) 173

Using the Book Panel 1: You may demonstrate how to fill out the table by giving an addition sentence that goes with each colored square. For example 1 + 4 = 5 goes with the orange square. The first addend, 1, is found in the pink (or red) column on the left. The second addend, 4, is found in the yellow row at the top. The sum is given in the orange square. Have the child trace 5 in the orange square. Tell the child to complete the addition table, paste it on a card, and use it as a reference for addition facts if necessary.

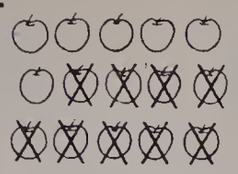
Panel 2: Tell the child to add.

Subtracting from Fifteen and Sixteen

Subtract.

1. 

$$\begin{array}{r} 15 \\ -\ 6 \\ \hline \end{array}$$

2. 

$$\begin{array}{r} 15 \\ -\ 9 \\ \hline 6 \end{array}$$

3. $\begin{array}{r} 15 \\ -\ 8 \\ \hline 7 \end{array}$ $\begin{array}{r} 15 \\ -\ 7 \\ \hline 8 \end{array}$

4. $\begin{array}{r} 16 \\ -\ 9 \\ \hline 7 \end{array}$ $\begin{array}{r} 16 \\ -\ 7 \\ \hline 9 \end{array}$

5. $\begin{array}{r} 15 \\ -\ 9 \\ \hline 6 \end{array}$ $\begin{array}{r} 15 \\ -\ 6 \\ \hline 9 \end{array}$

6. $\begin{array}{r} 15 \\ -\ 7 \\ \hline 8 \end{array}$ $\begin{array}{r} 15 \\ -\ 8 \\ \hline 7 \end{array}$

7. $\begin{array}{r} 16 \\ -\ 7 \\ \hline 9 \end{array}$ $\begin{array}{r} 16 \\ -\ 9 \\ \hline 7 \end{array}$

8. $\begin{array}{r} 16 \\ -\ 8 \\ \hline 8 \end{array}$ $\begin{array}{r} 14 \\ -\ 7 \\ \hline 7 \end{array}$

$\begin{array}{r} 16 \\ -\ 8 \\ \hline 8 \end{array}$ $\begin{array}{r} 15 \\ -\ 9 \\ \hline 6 \end{array}$ $\begin{array}{r} 16 \\ -\ 7 \\ \hline 9 \end{array}$ $\begin{array}{r} 15 \\ -\ 7 \\ \hline 8 \end{array}$ $\begin{array}{r} 14 \\ -\ 7 \\ \hline 7 \end{array}$ $\begin{array}{r} 14 \\ -\ 5 \\ \hline 9 \end{array}$

$\begin{array}{r} 14 \\ -\ 8 \\ \hline 6 \end{array}$ $\begin{array}{r} 14 \\ -\ 9 \\ \hline 5 \end{array}$ $\begin{array}{r} 15 \\ -\ 6 \\ \hline 9 \end{array}$ $\begin{array}{r} 16 \\ -\ 9 \\ \hline 7 \end{array}$ $\begin{array}{r} 15 \\ -\ 8 \\ \hline 7 \end{array}$ $\begin{array}{r} 14 \\ -\ 6 \\ \hline 8 \end{array}$

Using the Book Panel 1: Relate the subtraction to the picture by telling a story: "Richie has 15 apples. He ate 6. How many apples are left? (9)" Have the child trace the X's to show the subtraction. Ask, "Fifteen minus 6 is what number?" Have the child trace 9.

Panel 2: Use procedures similar to panel 1. Point out that these are related subtraction facts since they both use the numbers 15, 6, and 9.

Panels 3-10: Tell the child to subtract.

OBJECTIVE

To subtract from 15 and 16

PACING

Level A	All (1-4 guided)
Level B	All (1-3 guided)
Level C	All (1-2 guided)

MATERIALS

16 blocks, subtraction practice cards (vertical form): sums 15 and 16

SUGGESTIONS

Initial Activities 1. Show a set of 15 blocks. Have the child take away 8 blocks. Ask, "How many are left? (7)" Develop the vertical subtraction 15 - 8 = 7 relating to the blocks. Then have the child remove 7 blocks from the set of 15 blocks. Develop the vertical subtraction 15 - 7 = 8.

2. Develop the subtraction facts for sums 15 and 16 using the procedures above.

3. Shuffle the subtraction practice cards and arrange them on the chalkrail. Have the child match related subtraction facts as:

$\begin{array}{r} 16 \\ -\ 9 \\ \hline 7 \end{array}$ $\begin{array}{r} 16 \\ -\ 7 \\ \hline 9 \end{array}$

EXTRA PRACTICE

Write these on the chalkboard. Ask students to write an answer for each. Then select students to write answers to specific questions.

1. $\begin{array}{r} 16 \\ -\ 3 \\ \hline \end{array}$ $\begin{array}{r} 16 \\ -\ 4 \\ \hline \end{array}$ $\begin{array}{r} 15 \\ -\ 5 \\ \hline \end{array}$ $\begin{array}{r} 16 \\ -\ 6 \\ \hline \end{array}$ $\begin{array}{r} 15 \\ -\ 4 \\ \hline \end{array}$

2. $\begin{array}{r} 16 \\ -\ 7 \\ \hline \end{array}$ $\begin{array}{r} 15 \\ -\ 8 \\ \hline \end{array}$ $\begin{array}{r} 16 \\ -\ 8 \\ \hline \end{array}$ $\begin{array}{r} 15 \\ -\ 6 \\ \hline \end{array}$ $\begin{array}{r} 16 \\ -\ 6 \\ \hline \end{array}$

3. $\begin{array}{r} 16 \\ -12 \\ \hline \end{array}$ $\begin{array}{r} 15 \\ -13 \\ \hline \end{array}$ $\begin{array}{r} 16 \\ -14 \\ \hline \end{array}$ $\begin{array}{r} 15 \\ -13 \\ \hline \end{array}$ $\begin{array}{r} 15 \\ -15 \\ \hline \end{array}$

4. $\begin{array}{r} 15 \\ -\ 9 \\ \hline \end{array}$ $\begin{array}{r} 16 \\ -\ 9 \\ \hline \end{array}$ $\begin{array}{r} 15 \\ -10 \\ \hline \end{array}$ $\begin{array}{r} 16 \\ -10 \\ \hline \end{array}$ $\begin{array}{r} 16 \\ -16 \\ \hline \end{array}$

RELATED AIDS

ACT. MASTERS—18, 20, 26.
—Seasonal 3, 4.
—Gen. Use 10, 11, 13.
BFA COMP LAB I—49.

OBJECTIVE

To subtract from 17 and 18

PACING

Level A	175 All (1-4 guided) 176 All
Level B	175 All (1-3 guided) 176 All
Level C	175 All (1-3 guided) 176 All

MATERIALS

18 blocks

SUGGESTIONS

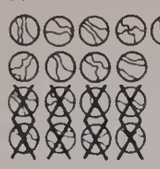
Initial Activities 1. Have the child show a set of 17 blocks. Tell the child to remove 9. Ask, "How many are left? (8)" The child may verify by counting. Develop the vertical subtraction 17 - 9 = 8 relating to the blocks.

2. Develop the vertical subtractions 17 - 8 = 9 and 18 - 9 = 9 using the procedure above.

Subtracting from Seventeen and Eighteen

Subtract.

1.



17 − 8

2.

17 − 9 = 8

3.

1 −

4.	17 − 9 = 8	15 − 8 = 7	16 − 9 = 7	18 − 9 = 9	14 − 6 = 8	15 − 9 = 6
5.	14 − 7 = 7	13 − 6 = 7	12 − 9 = 3	14 − 5 = 9	16 − 8 = 8	13 − 9 = 4
6.	14 − 8 = 6	15 − 6 = 9	17 − 8 = 9	14 − 9 = 5	16 − 7 = 9	15 − 7 = 8
7.	10 − 6 = 4	13 − 4 = 9	13 − 8 = 5	12 − 6 = 6	18 − 9 = 9	13 − 7 = 6
8.	15 − 8 = 7	17 − 9 = 8	16 − 7 = 9	12 − 3 = 9	14 − 5 = 9	15 − 6 = 9
9.	11 − 9 = 2	13 − 5 = 8	14 − 8 = 6	17 − 8 = 9	12 − 7 = 5	11 − 5 = 6

Using the Book Panel 1: Relate the subtraction to the picture by telling a story: "Mavis has 17 marbles. She lost 8. How many marbles does she have left? (9)" Have the child trace the X's to show the subtraction. Ask, "Seventeen minus 8 is what number?" Have the child trace 9.

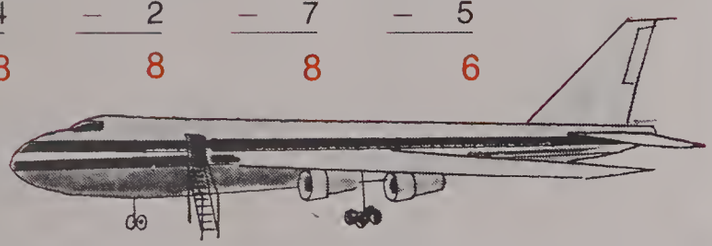
Panel 2: Use procedures similar to those in panel 1. Point out that since these subtractions both use the same numbers (17, 8, and 9) they are related subtraction facts.

Panel 3: Use procedures similar to panel 1.

Panels 4-9: Tell the child to subtract.

ubtract.

16	15	11	12	18	13
− 7	− 9	− 2	− 6	− 9	− 7
9	6	9	6	9	6
3	12	17	10	11	14
− 2	− 8	− 8	− 6	− 8	− 6
1	4	9	4	3	8
11	9	15	12	13	11
− 7	− 5	− 8	− 3	− 9	− 6
4	4	7	9	5	5
10	13	14	12	17	16
− 9	− 6	− 5	− 5	− 9	− 8
1	7	9	7	8	8
8	13	10	18	11	14
− 5	− 4	− 5	− 9	− 4	− 9
3	9	5	9	7	5
13	14	17	16	12	15
− 8	− 7	− 8	− 9	− 9	− 6
5	7	9	7	5	9
11	12	10	15	11	
− 9	− 4	− 2	− 7	− 5	
2	8	8	8	6	
4					
− 0					
4					



AT HOME Read some of the exercises and have the child give the answers. Say, "What is 16 minus 7?" and so on.

Using the Book Panels 1–8: Tell the child to subtract.

At Home After finishing the pupil page, the child may take it home and complete the At Home activity at the bottom of the page.

ACTIVITIES

1. Give the child vertical subtraction cards for sums 13-18. Have the child group cards with the same difference.

2. Give the child oral practice on subtracting from 18 or less. You may wish to have the child write the subtraction first, say the answer, and then write the difference.

3. Play a game of "Subtraction Scramble." Divide the class into 5 teams. Assign each team a numeral from 5 to 9. Arrange chairs so that there is one more child than chairs. Hold up two vertical subtraction cards (such as 14−8 and 16−9). The children whose numerals are the differences to the problems called (in this case, 6 and 7) get up and "scramble" to another chair. The child left standing scores a point for a team. Hold up two more subtraction cards. The child standing goes back into the game. The team with the least amount of points wins.

EXTRA PRACTICE

Practice Exercises p. 256 (bottom).

Tell the child to subtract.

1.	16	13	11	17	15
	− 9	− 5	− 7	− 8	− 7
	7	8	4	9	8
2.	14	12	10	13	18
	− 9	− 6	− 9	− 4	− 9
	5	6	1	9	9
3.	17	12	16	14	13
	− 9	− 3	− 8	− 6	− 7
	8	9	8	8	6
4.	18	16	12	11	10
	− 9	− 7	− 8	− 8	− 2
	9	9	4	3	8
5.	11	12	14	13	17
	− 9	− 7	− 7	− 8	− 9
	2	5	7	5	8

RELATED AIDS

ACT. MASTERS—18, 20, 26.
—Seasonal 3, 4.
—Gen. Use 10, 11, 13.
BFA COMP LAB I—49.

OBJECTIVE

To find sums and differences in related additions and subtractions, sums 15 and 16, vertical form

PACING

Level A All (1 guided)

Level B All (1 guided)

Level C All (1 guided)

MATERIALS

15 blocks

SUGGESTIONS

Initial Activity Give the child 8 red blocks. Have the child place 7 blue blocks next to the red blocks. Write:

$$\begin{array}{r} 8 \\ +7 \\ \hline \end{array} \qquad \begin{array}{r} 15 \\ -7 \\ \hline \end{array}$$

Complete the addition and develop the subtraction by removing 7 blocks from the 15 blocks. Then change the order of the addends and follow the same procedure.

ACTIVITIES

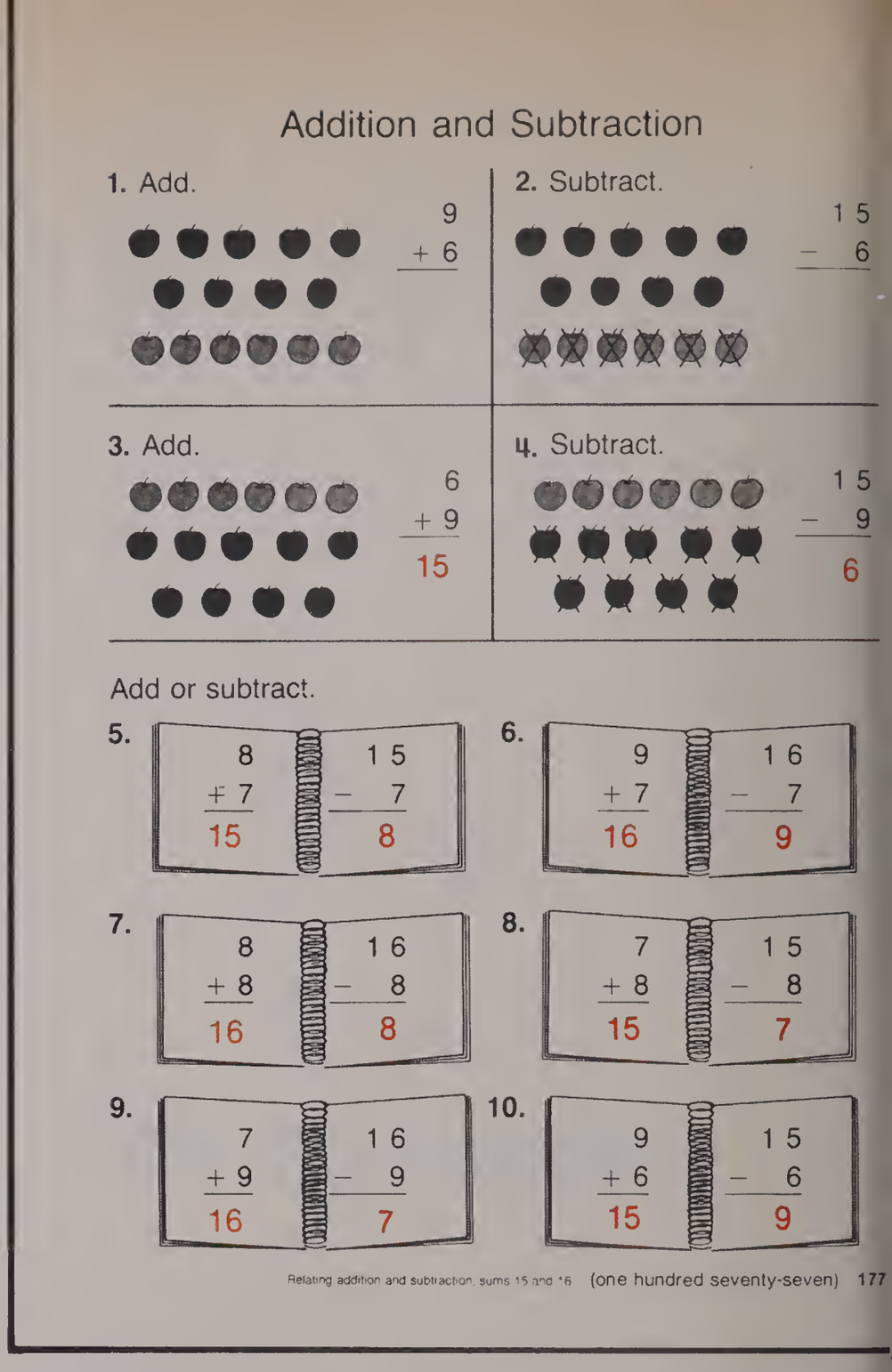
1. Provide 20 beans and vertical addition and subtraction practice cards for sums 10-16. Have the child arrange the beans to represent each addend and give the sum or difference.

2. To practice additions with sums 11 through 16, you may make a path of stepping stones on the floor. (Use 25 cm square cards.) Start:

6 9 7 5 8 7 4 9

As each step is taken, the child gives the sum of the two numbers on which he or she is touching. In the above example the child would say: 15, 16, 12, 13, 15, 11, 13.

3. Give the child the vertical addition and subtraction practice cards for sums 13, 14, 15, and 16. Ask the child to sort the cards into families. Then give each sum and each difference.



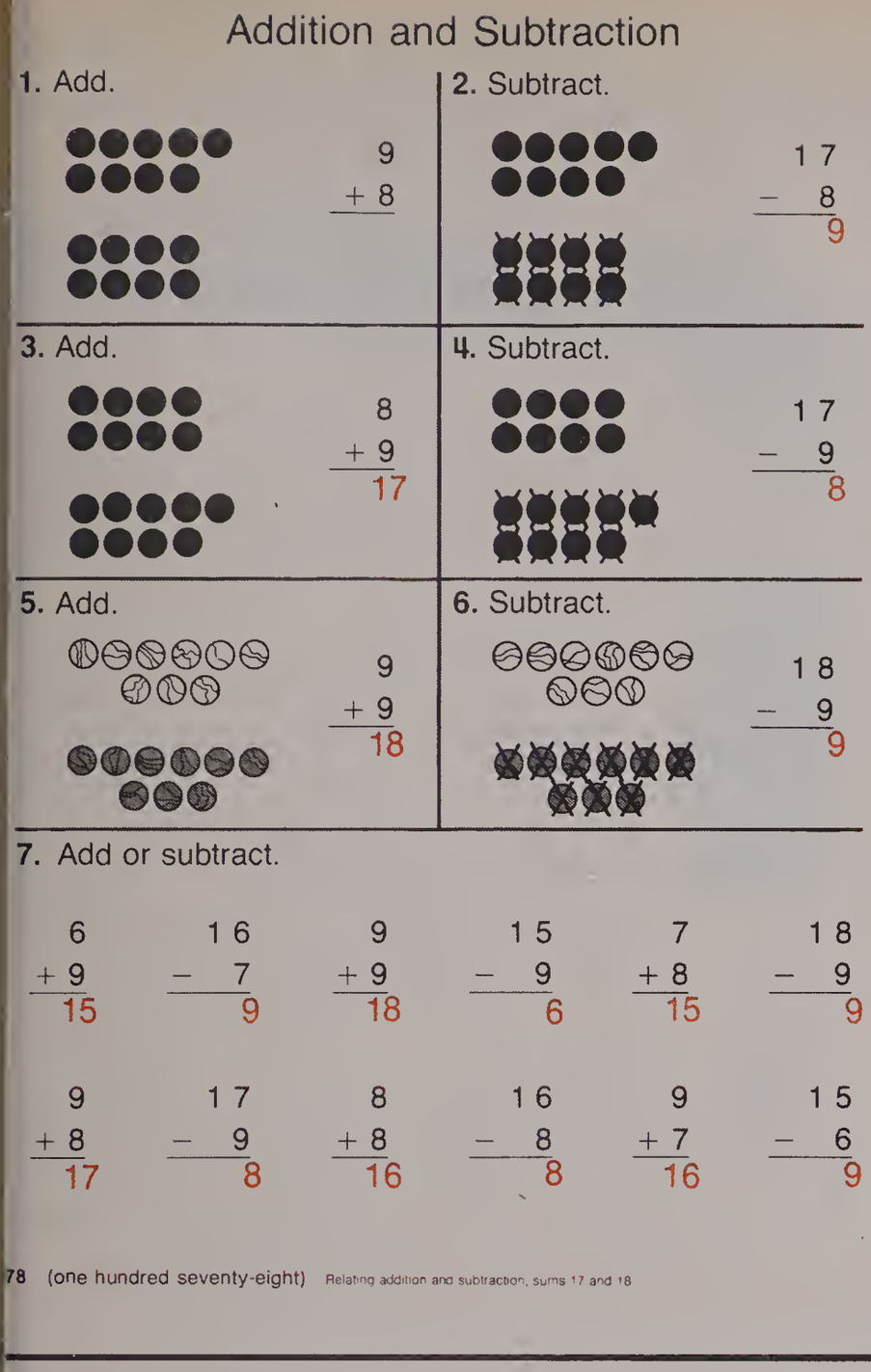
Using the Book Panels 1-2: Relate the addition to the picture by telling a story: "Louise has 9 red apples and 6 green apples. How many apples does she have in all? (15) Nine plus 6 is what number?" Have the child trace 15. For the subtraction, say, "There are 15 apples in all. Six apples are taken away. The X's show the apples taken away. How many apples are left? (9) Fifteen minus 6 is what number?" Have the child trace 9. Ask, "Do these exercises show related addition and subtraction? (yes)" Elicit that these exercises show adding 6 to 9 to get a sum, then subtracting 6 from that sum.

Panels 3-4: Point out that the order of the addends is changed to show adding 9 and subtracting 9. Have the child add and subtract.

Panels 5-10: Have the child add and subtract for each pair of exercises.

RELATED AIDS

ACT. MASTERS—18, 20, 24-26, 29.
—Seasonal 3, 4.
—Gen. Use 7-11, 13.
BFA COMP LAB I—10, 11, 49.
BFA PROB. SOLVING I—61.



Using the Book Panels 1-2: Relate the addition to the picture by telling a story: "June had 9 marbles. She won 8 marbles. How many marbles does she have in all? (17) Nine plus 8 is what number?" Have the child trace 17. For the subtraction, say, "June had 17 marbles in all. She lost 8 marbles. The X's show the marbles lost. How many marbles does she have left? Seventeen minus 8 is what number? (9)" Explain that these are related addition and subtraction exercises. They show adding 8 to 9 to get a sum, then subtracting 8 from that sum.

Panels 3-4: Use procedures similar to panels 1 and 2. Point out that the order of the addends is changed to show adding 9 and subtracting 9. Have the child add or subtract.

Panels 5-6: Have the child relate a story to the pictures and add and subtract.

Panel 7: Have the child add or subtract.

OBJECTIVE

To find sums and differences in related additions and subtractions, sums 17 and 18, vertical form

PACING

Level A All (1-4 guided)

Level B All (1 and 3 guided)

Level C All (1 guided)

MATERIALS

9 red blocks, 9 green blocks

SUGGESTIONS

Initial Activity Show a set of 9 red blocks and a set of 9 green blocks. Ask the child to give the number of each set and the number of blocks in all. Ask, "9 plus 9 is equal to what number? (18)" Write: 9 + 9 = ___. Have the child give the difference. Then have the child write each exercise in vertical form.

ACTIVITIES

1. Arrange 6 boxes (cut-off milk cartons) with numerals 13 through 18 on them. Have the child sort addition and subtraction practice cards in the box that has the numeral for the sum on it.

2. Use the Basic Fact Practice Cards for sums through 18. See Activity Reservoir.

3. Two children (or 2 teams) may play a guessing game. Provide addition practice cards, vertical form, for sums 11-18 with the sum for each card shown on the back of the card. One child holds up a card, say with 13 on the back. The back of the card is turned toward the second child. The first child says, "I see two numbers, one is 7. You see the sum. What is the other number?"

RELATED AIDS

ACT. MASTERS—18, 20, 24-26, 29.
—Seasonal 3, 4.
—Gen. Use 7-11, 13.
BFA COMP LAB I—10, 11, 49.
BFA PROB. SOLVING I—61.

OBJECTIVE

To solve word problems

PACING

Level A Ali (1-2 guided)

Level B All (1 guided)

Level C All

SUGGESTIONS

Initial Activities 1. The child might enjoy discussing something about bus terminals. Try to encourage the child to create word problems during the discussion. (It is immaterial whether or not the problems involve sums through 18 at this point.)

2. Write problems similar to those on page 179. Assist the child in reading the problems. Ask, "Should you add or subtract to find the answer to the question?" Then ask the child to write the addition or subtraction that goes with the problems and find the answer.

Discuss the consumer aspects of this page—air pollution and fuel consumption. Ask questions such as, "How do buses pollute the air? (faulty exhaust pipes, etc.) How does bad air affect our health? Why is it good for people to travel in groups, as on buses, etc.?"

ACTIVITIES

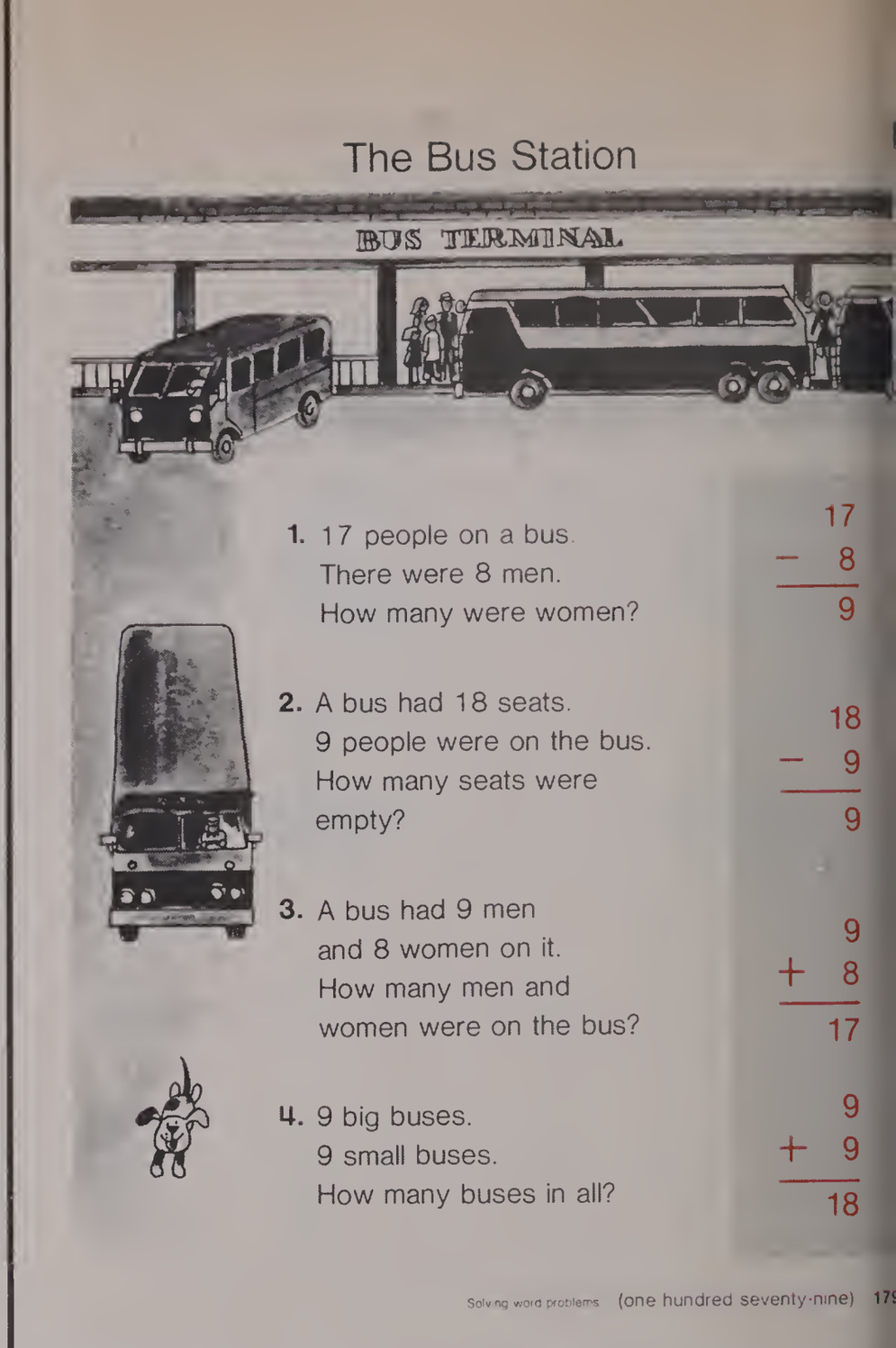
1. Use the Basic Fact Wheels described in the Activity Reservoir, for practicing sums through 18.

2. Let two children work together. Taking turns, one child makes up a problem, the other child writes it and finds the answer.

3. Assign the child an addition and a subtraction exercise. Have the child find the sum and the difference. Then challenge the child to write a word problem to go with each exercise. The word problems may be about a school activity.

RELATED AIDS

BFA PROB. SOLVING I—61-72.



Using the Book Have the child describe the picture. Ask if the child has ever been on a bus. If so, have the child talk about personal experiences when riding in a bus or visiting a bus terminal.

Panel 1: Have the child read the problem. Ask the child, "Do you add or subtract to find the answer? (subtract)" Tell the child to write the computation on the right, find the answer, and answer the question posed in the problem.

Panels 2-4: Have the child read each problem. Tell the child to write the addition or subtraction on the right, solve, and answer the question posed in the problem.

d.

8	9	7	9	8	7
+ 7	+ 8	+ 9	+ 9	+ 9	+ 8
15	17	16	18	17	15

302	406	3. 500	605
+ 576	+ 501	+ 70	+ 43
878	907	570	648

btract.

15	17	16	18	15	16
− 6	− 9	− 8	− 9	− 8	− 7
9	8	8	9	7	9

726	589	6. 976	273
− 423	− 304	− 42	− 53
303	285	934	220

423 boys.
435 girls.
How many children in all?

423
+ 435
858

8.

675 cars.
513 trucks.
How many more cars?

675
− 513
162

sing the Book This is a diagnostic test. The page references are given r re-teaching as needed. The letter indicates the objective.

Panel 1: Tell the child to add. [page 169 E]
Panels 2-3: Tell the child to add. [page 163 A]
Panel 4: Tell the child to subtract. [page 175 F]
Panels 5-6: Have the child subtract. [pages 165 B, 166 D]
Panels 7-8: Have the child read the problem and write an addition subtraction on the right. Then find the answer. [page 167 G]

OBJECTIVE

To evaluate achievement of the Chapter Objectives

PACING

Level A Omit 3 and 6

Level B All

Level C All

SUGGESTIONS

The Chapter Test is designed to be used in a diagnostic manner. It assesses the child's knowledge of the main concepts and skills that were taught in this chapter. Some children should take this test independently with guidance for instructions only. Use judgment as to whether certain children should be guided through some or all of the exercises. Check each child's work and mark the items that are incorrect. Reteaching or extra practice might be necessary to help the child acquire the concept or skill that was missed. With this reteaching, you will be able to ascertain whether the child has then learned the topic in question. See Using the Book for page references indicating where the concept or skill was taught.

ACTIVITIES

1. Involve the child in a game of Stop the Magician as described in the Activity Reservoir. Use basic facts through sum 18.

2. Use the Basic Fact Wheels described in the Activity Reservoir to review basic facts through sum 18.

3. Play Concentration described in the Activity Reservoir. Include money notation, time, fractions, and adding and subtracting sums through 18.

CHAPTER 10 OVERVIEW

This chapter concentrates on geometry and measurement.

Two-dimensional figures (triangle, rectangle, square, circle) and three-dimensional figures (ball, cone, box, can) are studied.

Measurement is developed first through nonstandard units. Standard units of length, capacity, and mass are taught and extended for the metric system. Temperature is introduced.

OBJECTIVES

A To identify the first through the twentieth members in an ordered set
B To identify and draw line segments, triangles, rectangles, squares and circles
C To identify inside, outside and on
D To identify spheres, cubes, cylinders and cones as balls, boxes, cans and cones
E To identify and count faces, edges and corners
F To identify similar objects
G To identify symmetry
H To find lengths in centimetres and metres
I To state relationships between liquid measures: litre, half litre, quarter litre
J To read a thermometer
K To find mass to nearest kilogram, to introduce the gram
L To add three addends, using two-digit numerals

VOCABULARY

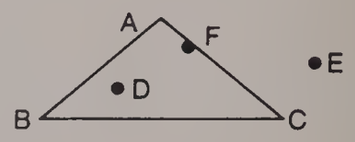
tenth through twentieth 181
paths 182
straight paths 182
points 182
line segment 182
endpoint 182
triangle 183
sides 183
corners 183
rectangle 184
square corner 184
square 185
circle 186
inside 187
on 187
outside 187
box 188
cone 188
can 188
ball 188
shapes 188
faces 190
corners 190
edges 190
tesselations 191
similar 192
similarity 192
symmetry 193
longer 195
shorter 195
same length 195
longest 195
shortest 195
units 196
unit of measure 196
centimetre(s) 197
metre(s) 199
litre 202
half litre 202
quarter litre 202
temperature 204
thermometer 204
degrees 204
mass 205
scale 205
balance 205
lighter 205
kilogram(s) 206
gram 206
scale 206
weigh 206
balance 206
mass 206

BACKGROUND

1. The concept of a point may be illustrated by a dot. The smaller the dot we use to represent a point, the better the representation. Children will not be concerned with the abstract nature of a point. We will simply use a dot and call it a point.

2. A line segment is a straight path from one dot to another. The sides of triangles, rectangles, and squares are line segments.

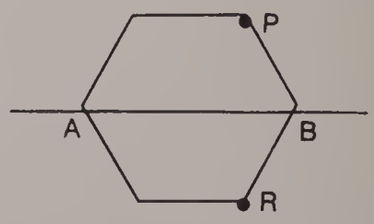
3. Triangles, rectangles, squares and circles are also geometrical concepts. For example, a triangle is a set of points. The triangle shown below is the set of all points on the line segments AB, BC, and AC.



The points D and E are not points belonging to the set of points of the triangle. The point D is inside the triangle while the point E is outside the triangle. Point F is a member of the set of points of the triangle.

4. The common solids are spheres, rectangular parallelepipeds, cylinders, and cones. The usual names for these solids are balls, boxes, cans, and cones, respectively. The important thing is that the child learn some names for common shapes of solids in everyday life.

5. A geometric drawing is symmetric with respect to a line if for each point on the drawing, there is another point of the drawing such that the line is the perpendicular bisector of the line segment joining the two points. In the following figure, the points R and P are symmetric with respect to the line AB.



6. In the metric system the metre is a unit of length. The metre is divided into ten parts, each of which is a decimetre. A decimetre is divided into ten parts, each of which is a centimetre. Thus 100 centimetres is a metre. A centimetre is divided into ten parts, each of which is a millimetre.

MATERIALS

string, straightedge
objects with different lengths
objects with the same length
eraser, envelope, paper
centimetre ruler, metre stick
cards cut into strips of varying lengths
wire triangle, rectangle, circle, square
cone, can, box, ball
colored water, fine sand, or salt
litre, half litre, quarter litre containers
scale, objects to weigh
demonstration and real thermometers
9 full ten-boxes, 9 blocks
balance scale and masses

CAREER AWARENESS

Forest Rangers [208]

Forest rangers are responsible for protecting state and national forest lands and the people who visit them. They discourage people from cutting tree branches and from being careless using fire in a forest. When a fire does occur, forest rangers may act as relays. From a tower headquarters or an elevated land area, they can keep firefighters and information centers posted as to the location of a fire. They also serve as relays between ground search parties, planes, and helicopters in the rescue of people lost in the forest.

It is important that children develop an awareness of self and others. Children should realize that forest rangers are constantly aware of the people throughout the forest. People in the forest should be aware that any carelessness can create a fire that could endanger their lives and others.

Photo description: On a dry day, this forest fire observer (a ranger's helper) is watching the forest with binoculars for signs of fire. If she sees anything unusual, she relays the information on her radio system to the district forest ranger.

BULLETIN BOARD

1. Help the children make a mural for the bulletin board. Each child's contribution must incorporate one or more geometric figures. (A triangular-shaped hat on a woman, for example.) Let each child choose a medium, but it might be well worthwhile discouraging the use of paint for this project. After the mural is finished, many discussions can grow out of examining it. Children can decide which shapes are big circles or which are small triangles. Graphs can be made to record the breakdown of information gleaned from the mural.

2. Have each child make a chart showing guesses and actual measurements, to the nearest metre, of common measures in the room. The children could choose what the class is to measure or you might decide. When the children have finished, appoint committees of counters to tabulate information like the following: number of children who guessed that the door was so many metres high; number of children who measured the distance to the principal's office as so many metres; and so on. Children can then graph the result and display the graphs along with the raw information. Since there are bound to be some outrageous estimates, the children should be entertained by comparing their guesses.

Name _____

	I guessed	I measured
length of room		

3. Display a large demonstration thermometer with a tape that can be manipulated. Have children be responsible for reading an inside and outside thermometer at different times during the day, recording the temperatures (with numeral cards) on the bulletin board, and showing the outside temperature on the demonstration thermometer. Some children might be able to report evening temperatures.

SPECIAL NOTES

For the career on page 208, you might plan in advance to invite a forest ranger to your class.

For page 203 you may wish to discuss the consumer aspects of this page—comparing (which is more). This is eventually associated with cost and becomes which is the better buy.

OBJECTIVES

To identify ordinals, first through twentieth

PACING

Level A	All
Level B	All
Level C	All

VOCABULARY

tenth through twentieth

MATERIALS

blocks, numeral cards, worksheet

SUGGESTIONS

Initial Activity Arrange 20 blocks in a row. Ask the child to count them from left to right and match the numeral cards for 1 through 20 with the blocks. Then have the child match the number words, one through twenty, with the numerals.

Have the child identify the first through twentieth block with as little assistance as possible. Have the child touch the seventh block, the second object and so on. Finally the child matches the word cards for first through twentieth with the blocks.

ACTIVITIES

1. Give the child a worksheet:
Match the word with the number that comes immediately before:

twelfth	15th
second	11th
sixteenth	1st
fourteenth	7th

Match the number with the word that comes immediately after:

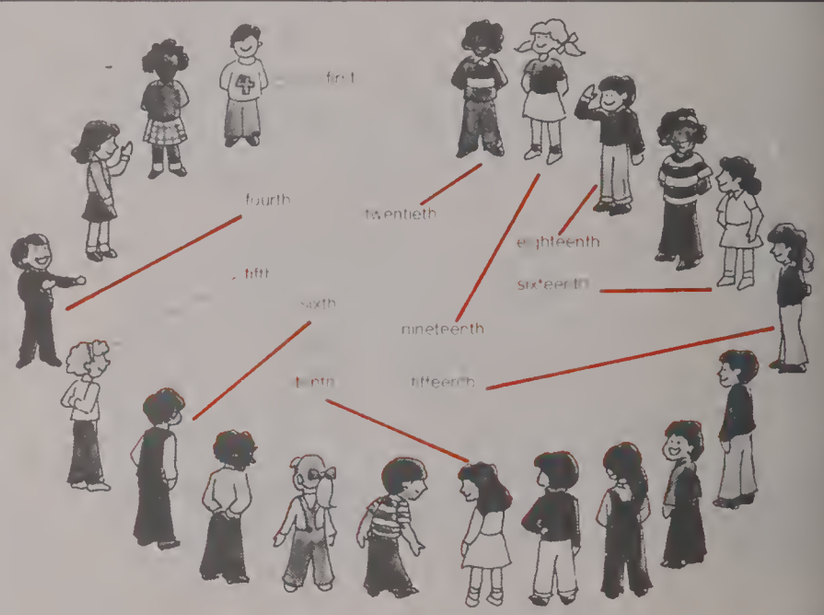
12th	third
2nd	seventeenth
16th	sixth
19th	twentieth
9th	eleventh

2. Children may enjoy a game called What's Missing? Prepare a set of 20 cards with the numerals 1 to 20 on the cards. Line the cards up in order from 1 to 20 on the floor or the blackboard tray. One child covers eyes while a second child removes one of the cards from the row and rearranges the cards so there is no gap where the card was removed. The first child uncovers the eyes and quickly tells which number is missing (the fifth).

Which One?

1. Match.

2.

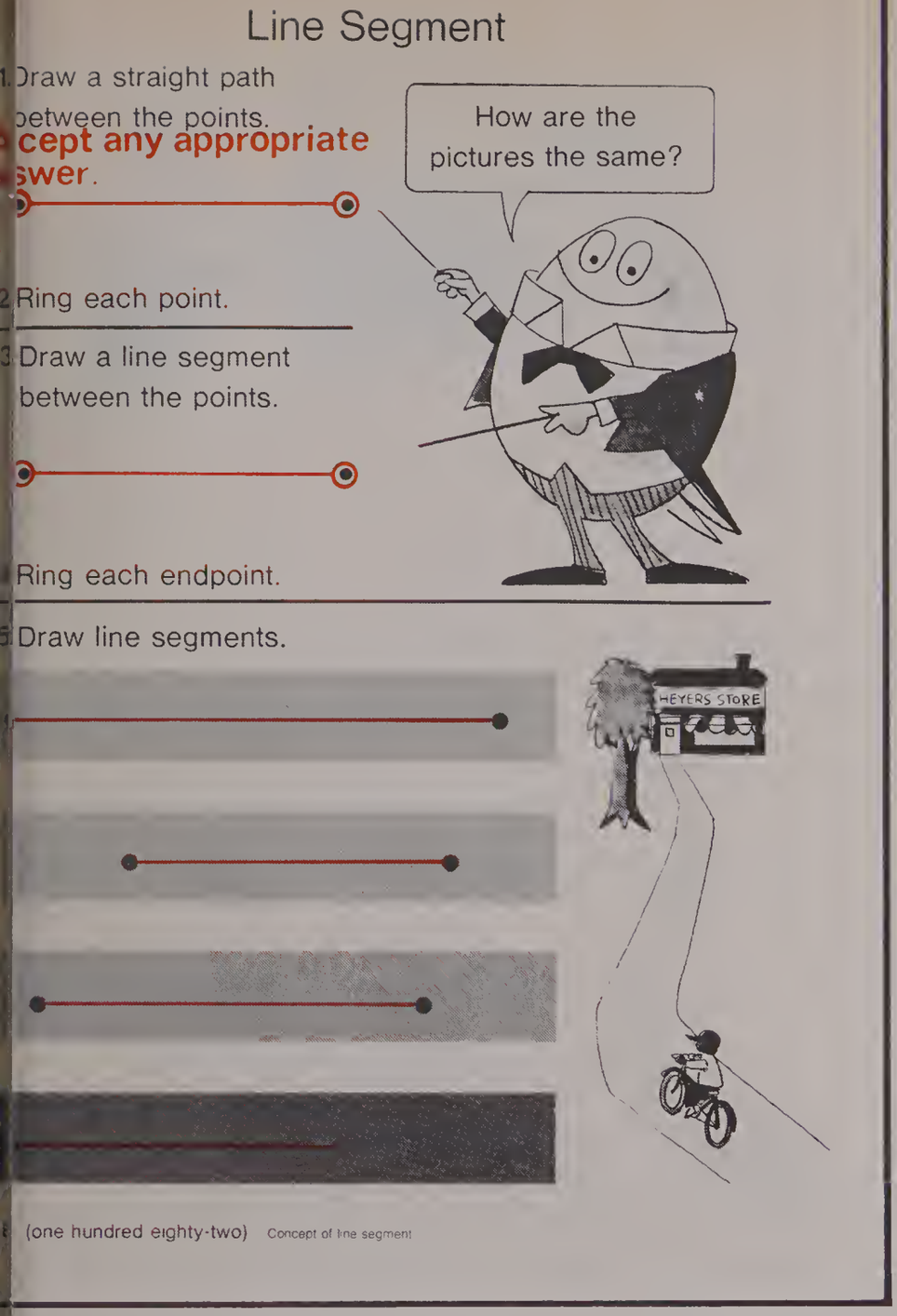


Using the Book Panel 1: Read with the child, the ordinals first through twentieth found below each shirt. Then have the child trace the line from the word *first* to the first sweater. Repeat the procedure for the word, *second* and *eleventh*. Tell the child to draw lines from the words to the corresponding shirts.

Panel 2: Have the child trace the line from the word *first* to the first person in the circle. Repeat the procedure for the *fifth* child. Tell the child to draw lines from each of the given ordinals to the child in the corresponding position in the circle. Note the fact that some of the ordinals first through twentieth are not given.

RELATED AIDS

ACT. MASTERS—32.



ng the Book Panels 1-4: Have the child follow the directions in Exercises nd 2. Then have the child follow the directions in Exercises 3 and 4. Ask child to describe the parts of each picture. Point out to the child that a e segment is a straight path and the point at each end of a line segment is an lpoint.

Panel 5: Have the child practice drawing line segments.

OBJECTIVES

To draw line segments
To identify endpoints

PACING

Level A	All (1-4 guided)
Level B	All (1-4 guided)
Level C	All (1-4 guided)

VOCABULARY

endpoint, line segment, paths, straight paths, points

MATERIALS

straightedge or ruler

BACKGROUND

See Item 2 in the Chapter Overview Background.

SUGGESTIONS

Initial Activity Draw 2 dots about 20 cm apart. Connect them with a straight path and ask the child to identify it as such. Say, "This is also a picture of a line segment." Have the child touch the ends of it. Explain that each line segment has 2 endpoints.

ACTIVITIES

1. Give the child a sheet of paper with 2 dots on it to draw a straight path from one dot to the other.

2. Draw 2 points about 40 cm apart on the chalkboard. Blindfolded, the child holds chalk in one hand and you put the chalk on one point. Put a fingertip of the other hand on the other point. The child then tries to draw that line segment.

3. Print letters like E, F, H, L, and M. Ask, "What is the least number of line segments you can draw to make each letter? (4, 3, 3, 2, 4)"

OBJECTIVES

To identify triangles
To know that a triangle has 3 sides and 3 corners

PACING

Level A	All (2 guided)
Level B	All (2 guided)
Level C	All (2 guided)

VOCABULARY

triangle, sides, corners

MATERIALS

wire triangle

BACKGROUND

See Item 3 of the Chapter Overview Background.

SUGGESTIONS

Initial Activity Show the wire triangle. Ask, "What is it?" Have the child identify line segments and corners of the triangle. Tell the child each line segment is called a *side of the triangle.* Ask, "How many sides does a triangle have? (3) How many corners does a triangle have? (3)"

ACTIVITIES

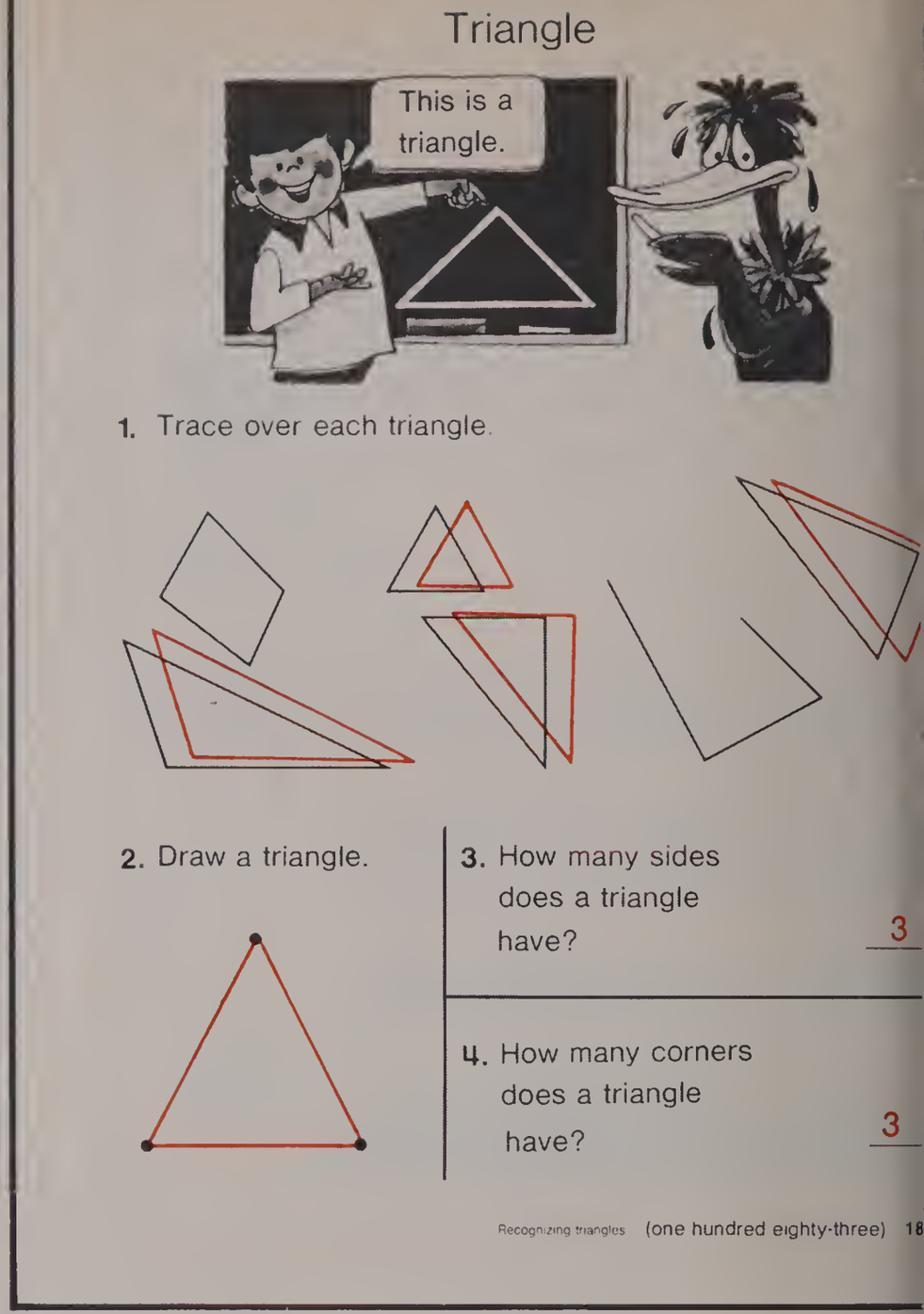
1. Ask the child to find parts of objects in the room that look like a triangle.

2. Have the child use a ruler, paper, and pencil, and draw triangles.

3. Draw various straight-line pictures that are not triangles. Ask the child to tell why each picture is not a triangle.

RELATED AIDS

ACT. MASTERS—33-35.

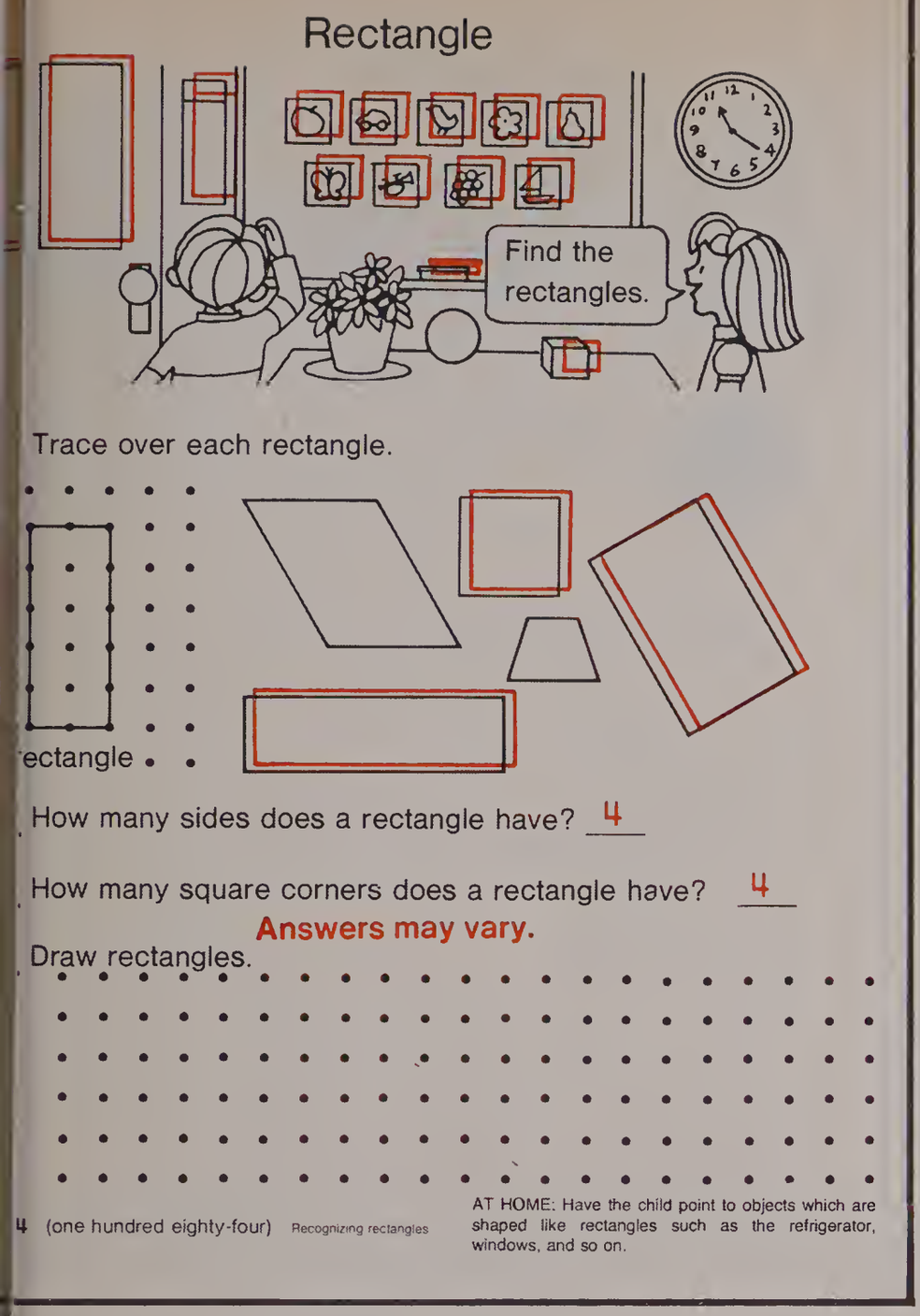


Using the Book Have the child read the boy's statement and trace over the triangle. You may wish to discuss that the line segments are the sides of the triangle. Then explain, two sides of a triangle meet at a point forming a corner of the triangle.

Panel 1: Have the child determine which of the figures are triangles and trace over each of them. Ask why the two untraced figures are not triangles. (One has four sides; in the other, two sides do not meet.)

Panel 2: Tell the child to draw line segments between the points. Then explain that the child has just drawn a triangle.

Panels 3-4: Have the child count the sides and the corners of the triangle just drawn, and fill in the blanks.



Using the Book Panels 1-3: Call attention to the drawing on the pegboard in panel 1. Have the child trace over it. Tell the child the figure is a rectangle. Read the question in panel 2 and have the child write the answer. Read the question in panel 3 and have the child write the answer. Then stress that a drawing with 4 sides and 4 square corners is a rectangle.

Now call attention to the red figures in panel 1. Tell the child to trace over each red rectangle. (There are three.) The child might use an envelope to test for square corners. Ask, "Why were two figures not traced? (They do not have square corners.)"

Next call attention to the picture at the top of the page. Ask, "What is the girl saying to the boy? (Find the rectangles.)" Have the child trace over each rectangle at the top of the page.

Panel 4: Tell the child, "Look at the rectangle on the pegboard in panel 1. Now draw some rectangles on the pegboard in panel 4. Each corner is to be on a dot. Make some rectangles with the longer side across the page."

At Home Upon completion of the pupil page, the child may take the page home and do the At Home activity suggested at the bottom of the page.

OBJECTIVES

To identify rectangles
To know that a rectangle has 4 sides and 4 square corners

PACING

Level A	All (top of page guided)
Level B	All (top of page guided)
Level C	All (top of page guided)

VOCABULARY

rectangle, square corner

MATERIALS

wire rectangle, wire triangle, envelope

SUGGESTIONS

Initial Activity Use the wire rectangle to develop the ideas that a rectangle has 4 sides and 4 corners. Show the wire triangle. Ask the child to use an envelope and compare the corners of the rectangle and the triangle. Tell the child the rectangle has square corners. Use the envelope to check the corners.

ACTIVITIES

1. Have the child find parts of objects in the room that look like a rectangle and use a finger to trace over each part within reach.

2. The child may use a geo-board and rubber bands and show rectangles and triangles.

3. Have the child use a pegboard and a rubber band and construct a triangle with one square corner. Then try to construct a triangle with two square corners.

RELATED AIDS

ACT. MASTERS—33-35.

OBJECTIVES

To identify squares
To know that a square has 4 sides that are the same length and has 4 square corners

PACING

Level A	All (1-2 guided)
Level B	All (1-2 guided)
Level C	All (1-2 guided)

VOCABULARY

square

MATERIALS

wire square, wire rectangle, wire triangle, envelope

SUGGESTIONS

Initial Activity Show the wire rectangle and the wire square. Have the child describe each figure. (4 sides, 4 square corners) Develop the ideas that both figures are rectangles and that one figure has all sides the same length. Tell the child that a square is a special rectangle. Show the wire rectangle, square, and triangle. Have the child identify each of them.

ACTIVITIES

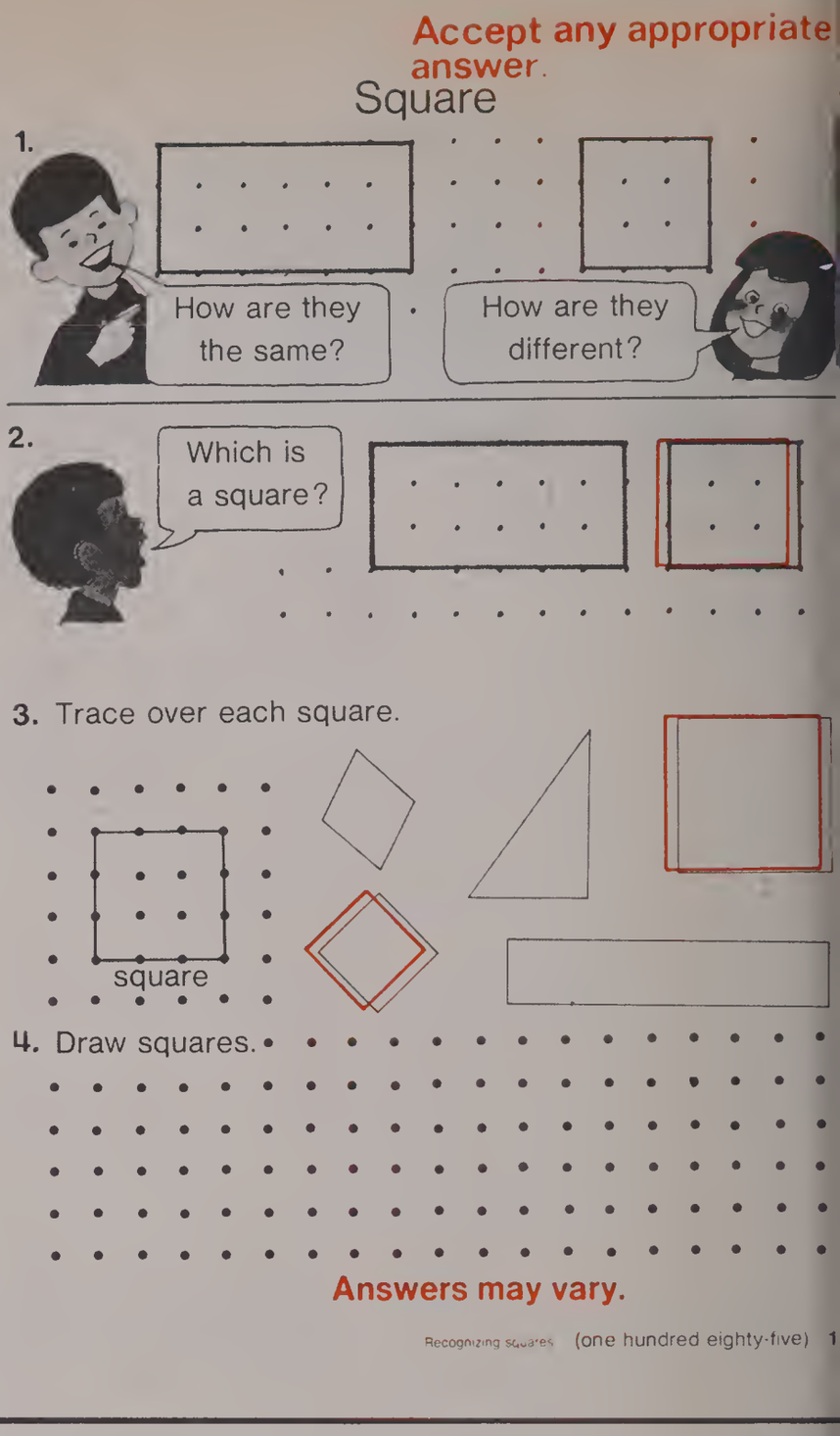
1. Perhaps the child can find parts of objects in the room that look like squares.

2. The child may use a geo-board and rubber bands to show rectangles, squares, and triangles.

3. Have the child draw squares. Each can be checked with a ruler and an envelope.

RELATED AIDS

ACT. MASTERS—33-35.

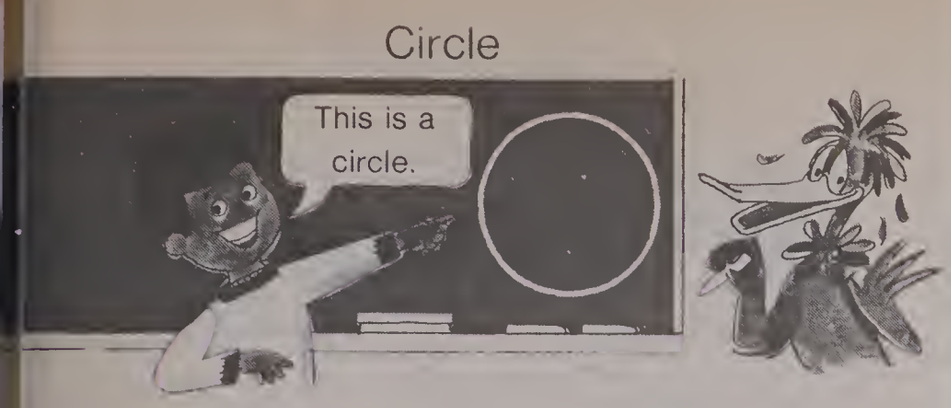


Using the Book Panel 1: Call attention to the blue and red figures on the pegboard. Ask, "Does the blue figure have four sides? (yes) Four square corners? (yes) Is it a rectangle? (yes)" Then ask, "Does the red figure have four sides? (yes) Four square corners? (yes) Is it a rectangle? (yes)" Ask, "Are the sides of the blue rectangle all the same length? (no) Are the sides of the red rectangle all the same length? (yes)" Tell the child that the red rectangle is a special rectangle called a square. Have the child trace over the square.

Panel 2: Have the child identify the square and trace over the square.

Panel 3: Have the child trace over each red figure that is a square. Ask why some figures were not traced.

Panel 4: Tell the child to look at the black square on the pegboard. Then tell the child to draw one or more squares on the pegboard making each corner on a dot.



Using the Book Tell the child that Plat Flat has just drawn a circle. Have the child trace over the circle. Ask, "Does a circle have any sides or corners? (no)"

Panel 1: Draw an egg-shaped figure on the chalkboard. Tell the child "The egg-shaped figure is not exactly round, so the figure is not a circle. A circle is round." Then tell the child to trace over each circle in panel 1. Ask the child to tell why the untraced figures are not circles. (not round and have corners)

Panel 2: Tell the child to draw circles by tracing over the dashed marks.

At Home Upon completion of the pupil page, the child may take the page home and do the At Home activity suggested at the bottom of the page.

OBJECTIVE

To identify circles

PACING

Level A All
Level B All
Level C All

VOCABULARY

circle

MATERIALS

wire circle

SUGGESTIONS

Initial Activities 1. Show the wire circle. Have the child identify and trace over the circle. Develop the ideas that a circle has no sides and no corners.

2. Draw an oval (not a circle). Discuss the idea that it is not exactly round, so it is not a circle.

3. Ask the child to find parts of objects in the room that look like circles and use a finger to trace over those within reach.

ACTIVITIES

1. Use Bulletin Board suggestion 1 in the Chapter Overview.

2. Have the child use clay or string to show circle shapes.

3. Have the child identify objects outside the room that look like a circle, a square, a rectangle or a triangle. The child may report this information to the class.

RELATED AIDS

ACT. MASTERS—33-35.

OBJECTIVE

To understand the concepts inside, outside, and on

PACING

Level A All (guided)
Level B All (4–6 guided)
Level C All

VOCABULARY

inside, on, outside

MATERIALS

a box, 1 block

SUGGESTIONS

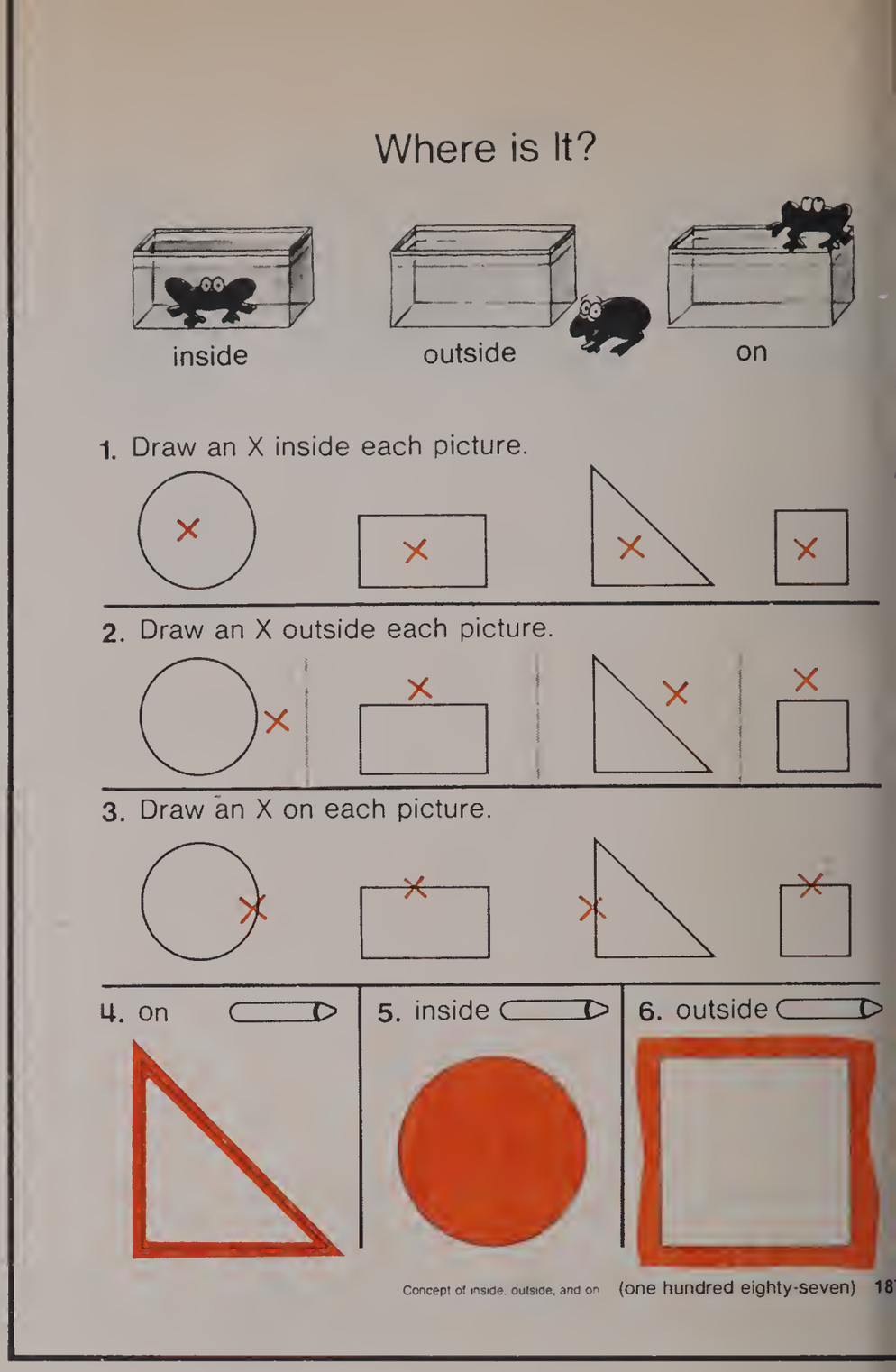
Initial Activity Place a block in a box to develop the idea of inside. Then place the block outside to develop the idea of outside. Draw a triangle. Have the child draw an X on it, inside, and finally outside the triangle.

ACTIVITIES

1. Use tape or string and make a triangle on the floor. Let 3 children hold the words, outside, inside, on, and take a position relative to the triangle to show the meaning of his or her word.

2. Adapt the Bingo Game described in the Activity Reservoir to provide practice on geometric concepts and basic addition and subtraction facts, sums 18 and less.

3. Adapt the game Concentration described in the Activity Reservoir. Use 8 cells.



Using the Book Tell the child to look at the picture on the left at the top of the page. Ask, "Is the frog inside, outside, or on the aquarium? (inside)" Ask the same question for each of the second and third pictures.

Panels 1–3: For each panel, ask the child to identify each figure and then follow the instructions at the top of the panel.

Panel 4: Have the child trace on the triangle with a black crayon.

Panel 5: Have the child color the inside of the circle red.

Panel 6: Have the child color the outside of the square blue.

Using the Book Have the child identify the objects in the left column as a ball, box, can, and cone.

Panels 1-4: For each panel, have the child color any object at the right that has a shape similar to the object pictured in the left column. Have a discussion about why some objects were not colored. Discuss other things such as:

In panel 2, the pocketbook is like a box if we ignore the strap (handle).

In panel 3, the cookie can is like the can if we ignore the handle.

In panel 4, the cone does not include the ice cream. The end of the pencil is a cone.

OBJECTIVE

To identify spheres, boxes, cylinders, and cones

PACING

Level A	All (1 guided)
Level B	All (1 guided)
Level C	All (1 guided)

VOCABULARY

box, cone, can, ball, shapes

MATERIALS

boxes, blocks, tennis ball, world globe, can, party hat in shape of cone, ice cream cone

BACKGROUND

See Item 4 of the Chapter Overview Background.

SUGGESTIONS

Initial Activity Display various objects that have the shape of a ball, box, can, and cone. Discuss the shapes of each.

ACTIVITIES

1. Ask the child to name and cut out pictures from newspapers, etc., of objects that have the shape of a ball, box, cone, and can.

2. For the pictures on page 188, have the child tell which parts look like rectangles. Do the same for circles, squares, and triangles.

3. Challenge the child to make the various shapes (cones, cans, balls, and rectangles) using clay, construction paper, paste, etc.

RELATED AIDS

ACT. MASTERS—36, 37.

OBJECTIVE

To recognize shapes

PACING

Level A All (1-2 guided)
Level B All (1-2 guided)
Level C All (1-2 guided)

MATERIALS

cardboard shapes of squares, rectangles, triangles and circles; wooden or plastic blocks of various shapes

SUGGESTIONS

Initial Activities 1. Give the child a set of geometric figures listed in the materials that have been cut from heavy paper or cardboard. Have the child trace the shapes on a sheet of plain paper. Some children will have difficulty holding the shape still while tracing. Give lots of practice tracing flat shapes before tracing three dimensional objects.

2. Give the child a set of squares (see materials for other shapes) that vary in size. Large squares should be easier to trace than small ones.

3. Have the child trace around wooden or plastic blocks that vary in thickness.

ACTIVITIES

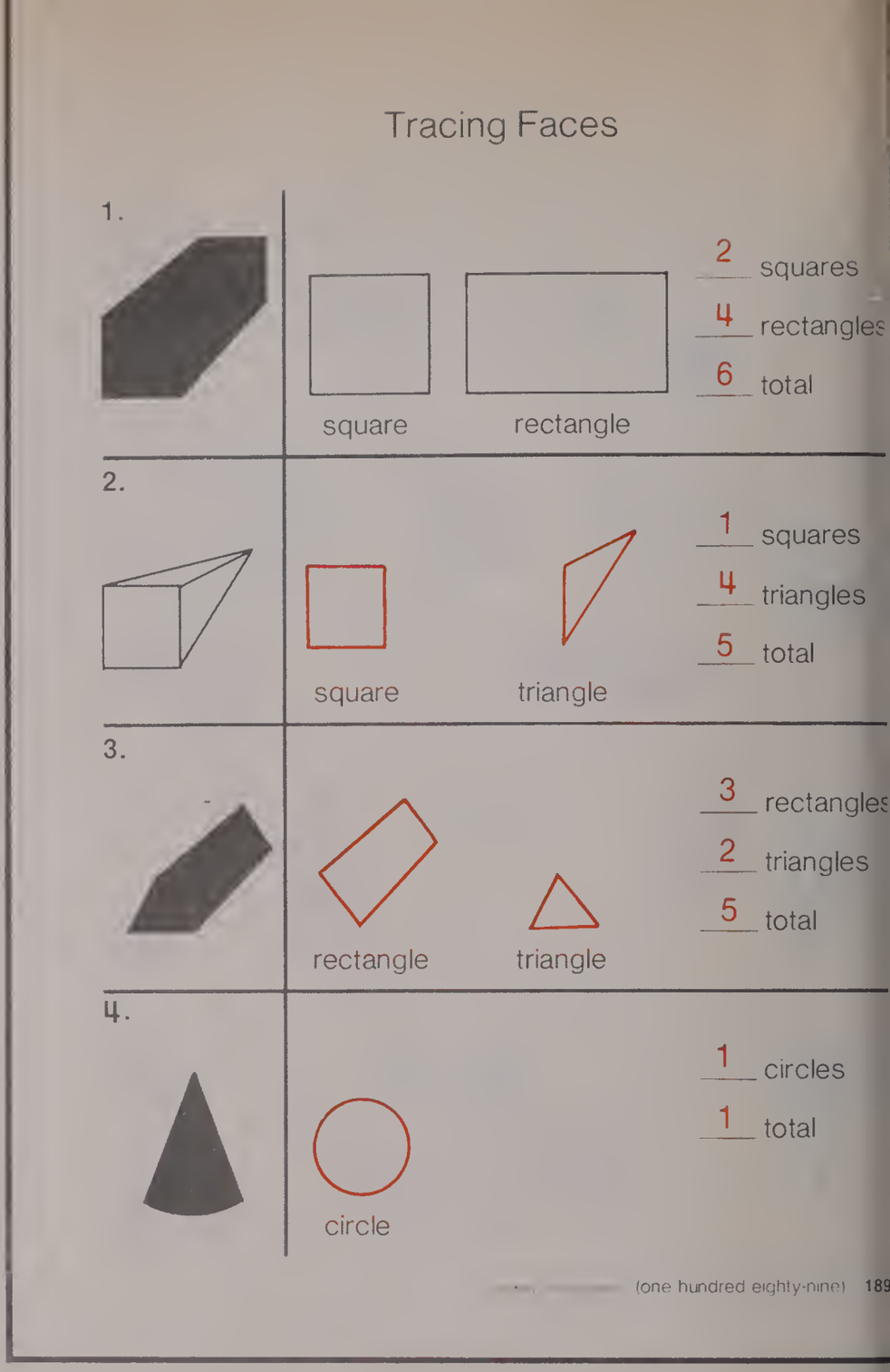
1. Give the child objects to trace around. The objects may be round, irregular, etc.

2. Have the child trace an object, turn it, then trace it again. Ask, "Does the object look the same every way you turn it?"

3. Challenge the child to make a picture by tracing different sized objects of one shape only.

RELATED AIDS

ACT. MASTERS—33-35, 37.



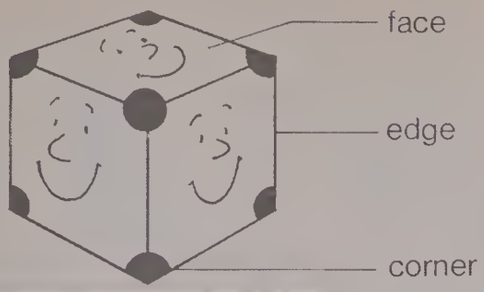
Using the Book This is an activity page.

Panel 1: Give the child a block and say, "Show me a face on the block that is a square." When the child has identified a square face, put the square face on the page and trace it above the word square. Then say, "Show me a face on the block that is a rectangle." Put the rectangular face on the paper and trace it. (You may find it necessary to do the tracing on a piece of plain paper if the shapes are too large for the space provided.) When the child has finished tracing the faces say, "Find all the faces on the block that are squares. How many are there?" Let the child mark each face with chalk as it is counted so that a face will not be counted twice. (2) Write 2 in the blank space before *squares*. Then ask, "How many rectangular faces are there?" (4) Write 4 in the blank space before *rectangles*. Have the student find the total number of faces by adding 2 + 4 and putting the answer in the blank space before *total*.

Panels 2-4: Adapt the procedure for panel 1.

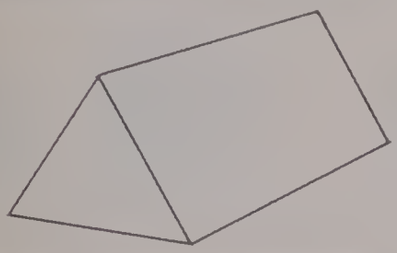
Counting Faces, Edges, and Corners

1.



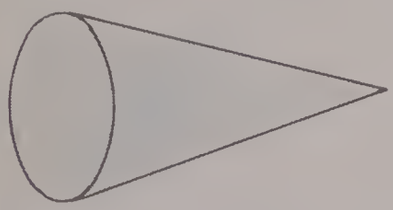
faces 6
edges 12
corners 8

2.



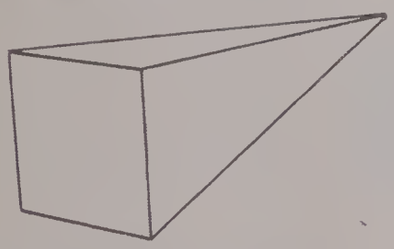
faces 5
edges 9
corners 6

3.



faces 2
edges 1
corners 1

4.



faces 5
edges 8
corners 5

Using the Book Panel 1: Give the child a block. Have the child draw a happy face on each of the block faces. Count the faces as they are drawn. Say, "Write the number of faces you have found in the space after the word *faces*." (6) Give the child some tape and say, "Stick a piece of tape on each of the edges of the block. Count the edges as you tape them. Write the number of edges you have found in the space after the word *edges*." (12) Say, "Put your finger on a corner of the block. Now we are going to count the corners." Mark the corners as they are counted. Ask, "How many corners does the block have?" (8) Write the number of corners you have found in the space after the word *corners*.

Panels 2-4: Adapt the procedure used for panel 1.

OBJECTIVE

To recognize and count faces, edges and corners

PACING

Level A	All (1-2 guided)
Level B	All (1-2 guided)
Level C	All (1-2 guided)

VOCABULARY

faces, edges, corners

MATERIALS

geometric shapes

SUGGESTIONS

Initial Activities 1. Give the child a set of geometric models or objects of varying shapes. Have the child choose one of the objects and feel it. Ask, "Do you feel some flat surfaces?" Explain these are called faces and may be in the shape of squares, rectangles, triangles, circles, etc. Then have the child feel the ridges (sharp edges) if the shape has any. Explain these are called edges. All shapes do not have edges. Finally, have the child trace with a finger, two edges that meet. Explain these meeting places are called corners.

2. Have the child identify the corners and edges of a piece of paper. Ask, "Where is the face?" (write on it)

ACTIVITIES

The child may enjoy making various shapes out of plasticine or modelling clay. Balls, boxes, cones can be made.

RELATED AIDS

ACT. MASTERS—36, 37.

OBJECTIVES

To draw patterns that fill a space

PACING

Level A All (1-2 guided)
Level B All (1-2 guided)
Level C All (1-2 guided)

VOCABULARY

tesselations

SUGGESTIONS

Initial Activities 1. Look for patterns in things around the classroom (ceiling tile, floor tile, etc.). Discuss the patterns and have the child explain how the pattern was made.

2. Give the child a piece of wallpaper that has a pattern on it. Have the child describe the pattern.

3. Look for patterns in nature (leaves, flowers, etc.).

4. Give the child a rectangular cardboard cutout (p. 189). Have the child trace the rectangle on a piece of plain paper. Move the rectangle so the end of the cutout touches one end of the tracing and trace again. Say, "Can you fill up all the space with rectangles?" (yes)

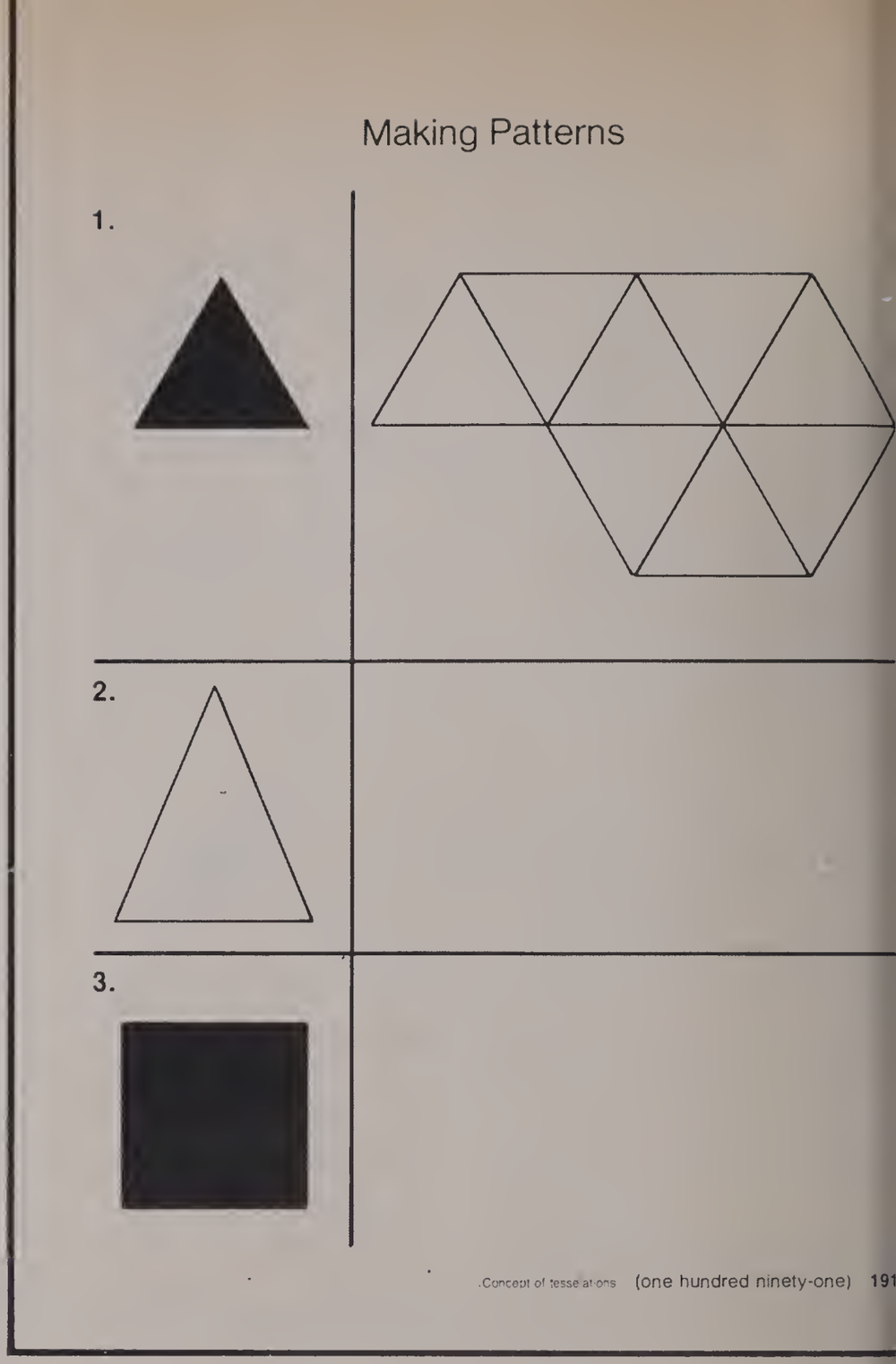
ACTIVITIES

1. Using the shapes from page 189, have the child choose one and make a pattern by moving and tracing the shape. Some shapes will fill all the space without leaving any gaps (square, triangle). Some shapes will leave gaps when they are traced (circle).

2. Make a bulletin board display of shapes that fill in all spaces (they tesselate) and shapes that fill in some of the space.

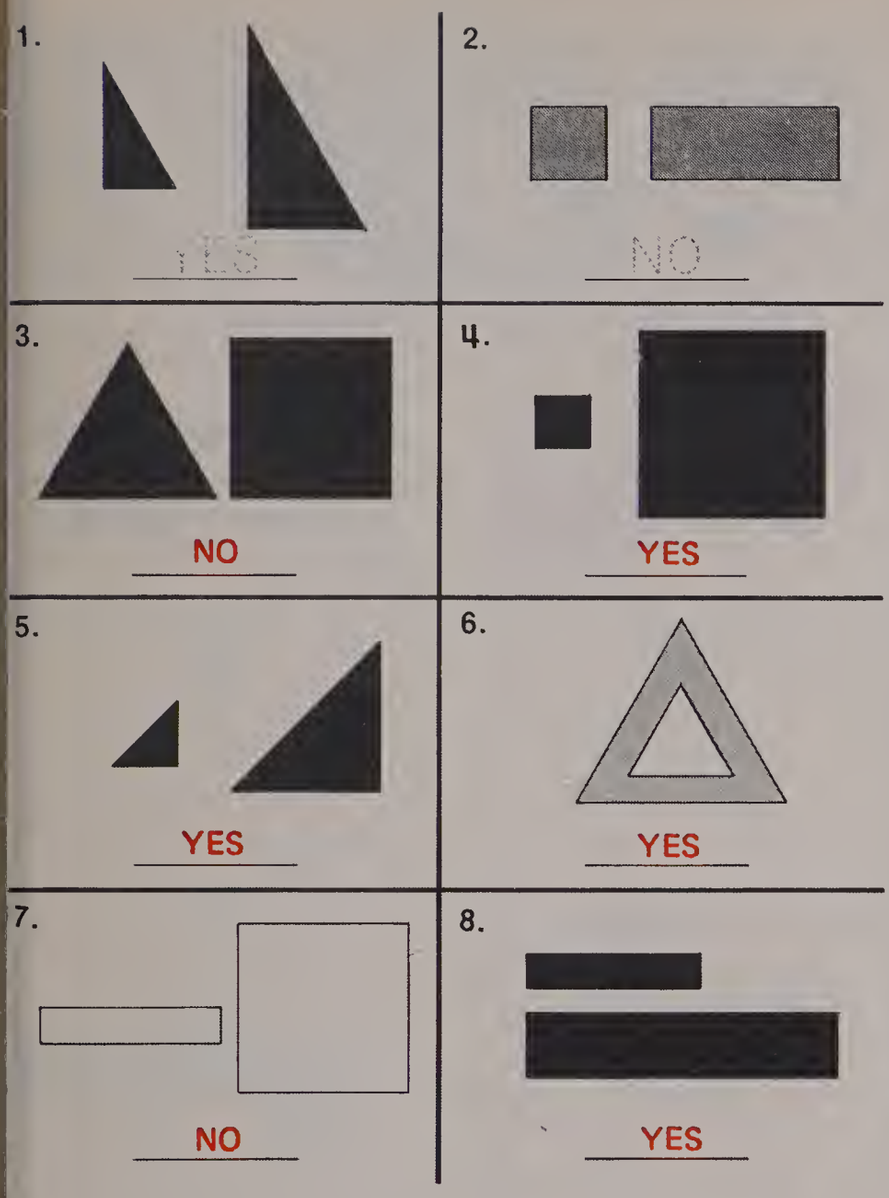
RELATED AIDS

ACT. MASTERS—38-40.



Using the Book Panel 1: Give the child a triangle similar to the one on the left. Have the student place the triangle on the first triangle (extreme left) and trace it. Ask, "What must we do with the triangle to make it fit the next piece of the pattern?" (turn it) Say, "Turn the triangle and trace it." Have the child complete the pattern by turning and tracing. Note that all the space can be filled.

Panels 2-3: Adapt procedure from panel 1.



92 (one hundred ninety-two) Concept of similarity

Using the Book Panel 1: Ask, "What name do we give to the small figure? (triangle) What name do we give to the large figure? (triangle) Explain that because both figures are triangles and look exactly alike except for size they are called similar figures. Because they are both the same except for size, write YES in the space below the figures. Say, "Trace the word YES."

Panel 2: Ask, "What name do we give to the small figure? (square) What name do we give to the large figure?" (rectangle) Say, "The figures are different in ways other than just size so they are not similar. Trace the NO below the picture of the figures."

Panels 3-8: Have the child write yes below the figures if they are similar or no if the figures are not similar.

OBJECTIVES

To identify figures that are similar

PACING

Level A	All (1-4 guided)
Level B	All (1-4 guided)
Level C	All (1-2 guided)

VOCABULARY

similar, similarity

MATERIALS

attribute blocks, plasticine

SUGGESTIONS

Initial Activities 1. Give the child a set of attribute blocks. Say, "Pick out all the squares." Ask, "In what way are the squares alike? (square corners, four sides, etc.) In what ways are they different? (emphasize size). Explain that shapes that look exactly alike except for size are called similar. Repeat the activity picking out all the rectangles.

2. Using plasticine or modelling clay, have the child make various sizes of different shapes. Emphasize that all the balls are the same except for size. They are similar.

ACTIVITIES

1. Give the child a worksheet with many different sizes of squares, rectangles and circles on it. Have the child color all the squares red, the rectangles blue, the triangles green and the circles yellow.

The child may begin making a booklet entitled "My Book of Shapes". Duplicated on the top part of a sheet of paper show a picture of a circle and the word, circle (square, rectangle, etc.). Have the child paste pictures of objects that have a circle shape.

RELATED AIDS

ACT. MASTERS—41.

OBJECTIVE

To identify figures that are symmetrical about a line

PACING

Level A	193 All (1-3, kite guided) 194 All (guided)
Level B	193 All (1-3, kite guided) 194 All
Level C	193 All (1-3, kite guided) 194 All

VOCABULARY

symmetry

MATERIALS

3 ordinary rectangular sheets of paper

BACKGROUND

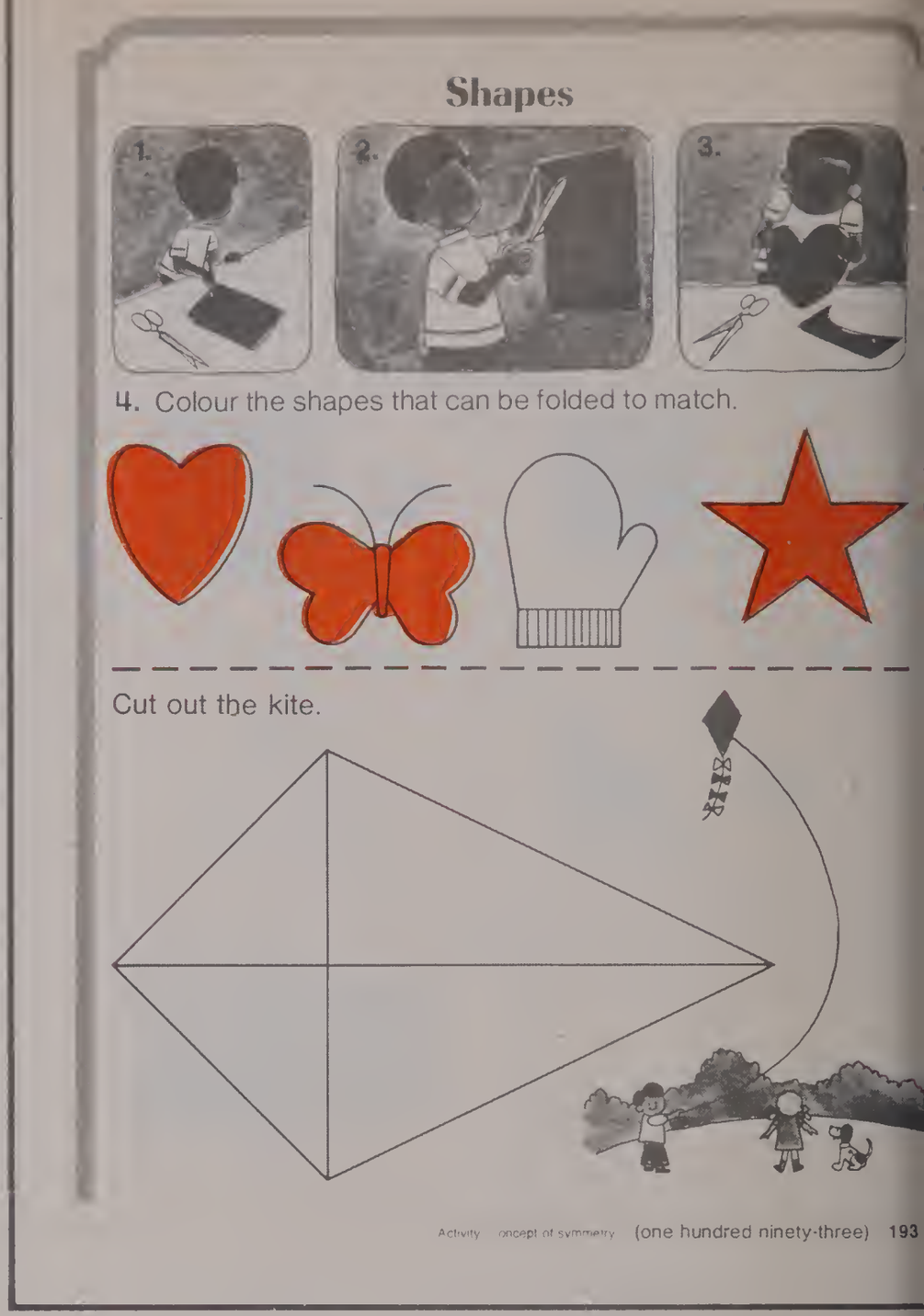
See Item 5 of the Chapter Overview Background.

SUGGESTIONS

Initial Activities 1. Display a rectangular sheet of paper with a vertical dotted line that separates the sheet into halves. Ask, "Do the two parts match when I fold the sheet along the dotted line?"

2. Show a rectangular sheet of paper with dotted lines from one corner to the opposite corner. Ask, "If we fold this sheet along the dotted lines, will the two parts match?" Have the child fold the sheet and verify that the two parts will not match.

3. Have the child suggest how to fold the sheet of paper so that the crease makes two parts that do match. (vertically, horizontally)

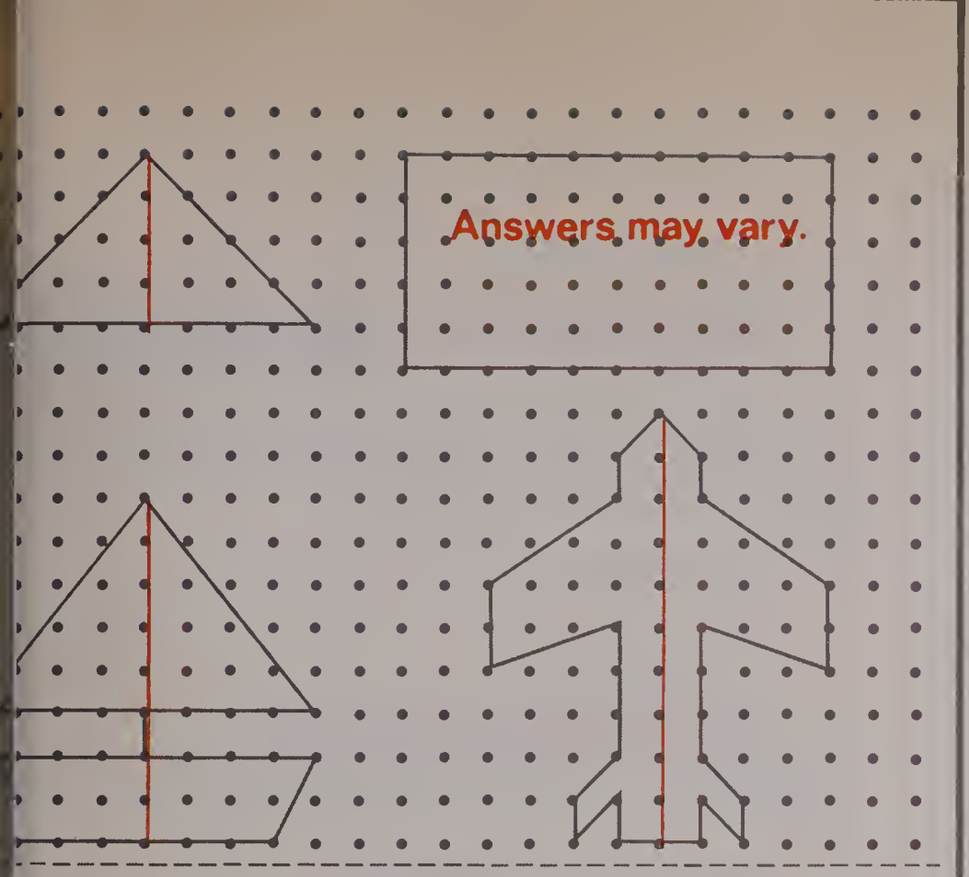


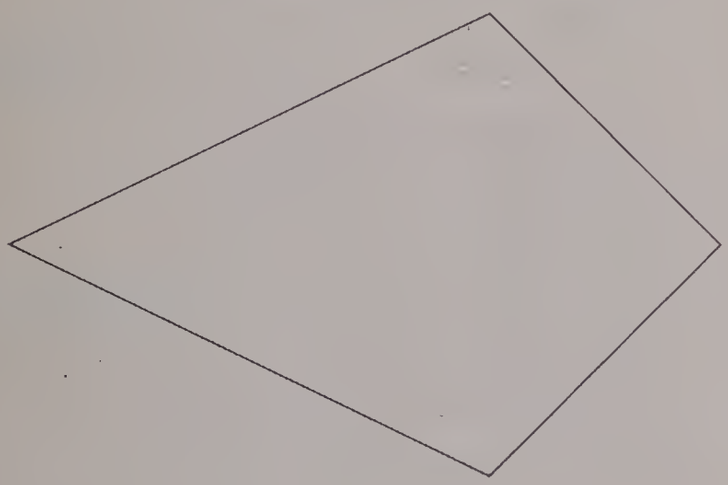
Using the Book This is an activity page. Assist the child in describing and doing the activity shown in the first three panels at the top of the page. Provide paper and scissors.

Panels 1-3: Panel 1 shows the boy has folded a sheet of red paper and drawn one side of a valentine. Panel 2 shows the boy is cutting along the mark. Panel 3 shows the boy has completed cutting along the mark and opened the valentine. For panel 3, ask, "Does the black line separate the valentine into two parts? Are the parts the same size and same shape? (yes) If the boy folds the valentine along the black line, would the two parts match? (yes)" You may wish to give the child scissors and a sheet of paper to duplicate the little boy's actions.

Panel 4: Tell the child to color each picture that can be folded to make two parts that match.

Bottom Panel: Have the child look at the kite. Ask, "Along which line do you think you can fold the kite so that the two parts match?" Then have the child cut out the kite and verify the answer. Make certain the child does not cut the top of the page.





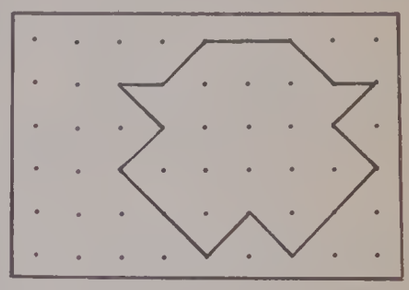
ing the Book Ask the child to find where each picture might be folded to ake two parts that match. Then have the child draw a line to indicate each ld.

Discuss that the rectangle has two possible answers.

ACTIVITIES

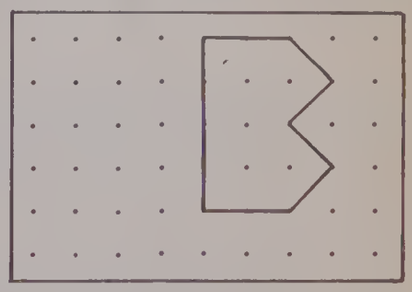
1. Have the child find and cut out pictures that can be folded to make two parts that match.

2. Have the child use a geo-board and rubber bands. Challenge the child to show pictures like the one below. When finished have the child place a red rubber band so that it separates the figure into two parts that match.



3. Give the child a 10 cm square sheet of paper. Tell the child to try to fold the sheet to make two parts that match. (vertically, horizontally, or on either diagonal)

4. Show half of a figure using a green rubber band on a geo-board. Use a red rubber band to show the mark that separates the figure into two parts that match. Have the child use a yellow rubber band and construct the other part of the figure to match the green part.



RELATED AIDS

ACT. MASTERS—41, 42.

OBJECTIVES

To determine the longer or shorter of two objects
To identify two objects that have the same length
To identify the longest and the shortest of three objects

PACING

Level A All (guided)
Level B All (1 guided)
Level C All

VOCABULARY

longer, shorter, same length, longest, shortest

MATERIALS

objects having different lengths, objects having the same length

SUGGESTIONS

Initial Activity Show objects having different lengths. Have the child identify the longer and the shorter of pairs of objects. Then identify the longest and the shortest of three or more objects. Give the child experiences in selecting pairs of objects of the same length.

ACTIVITIES

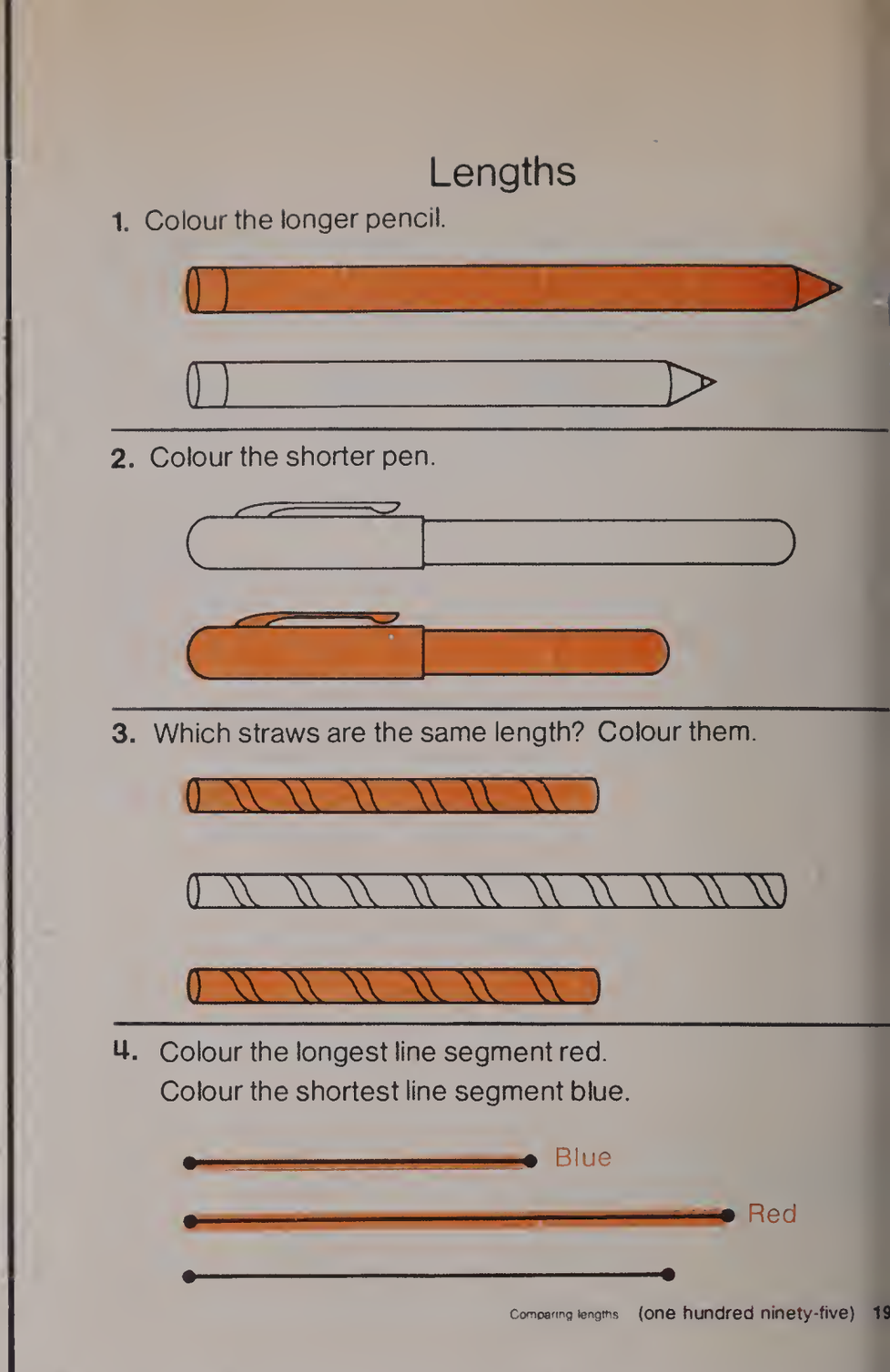
1. Give 3 children an object about 10 cm long. They find other objects that are longer, shorter, and same length as the given object.

2. Have the child choose pairs of objects that can be manipulated. The child guesses whether one is longer than the other, or the same length; then puts them side by side to check the guess.

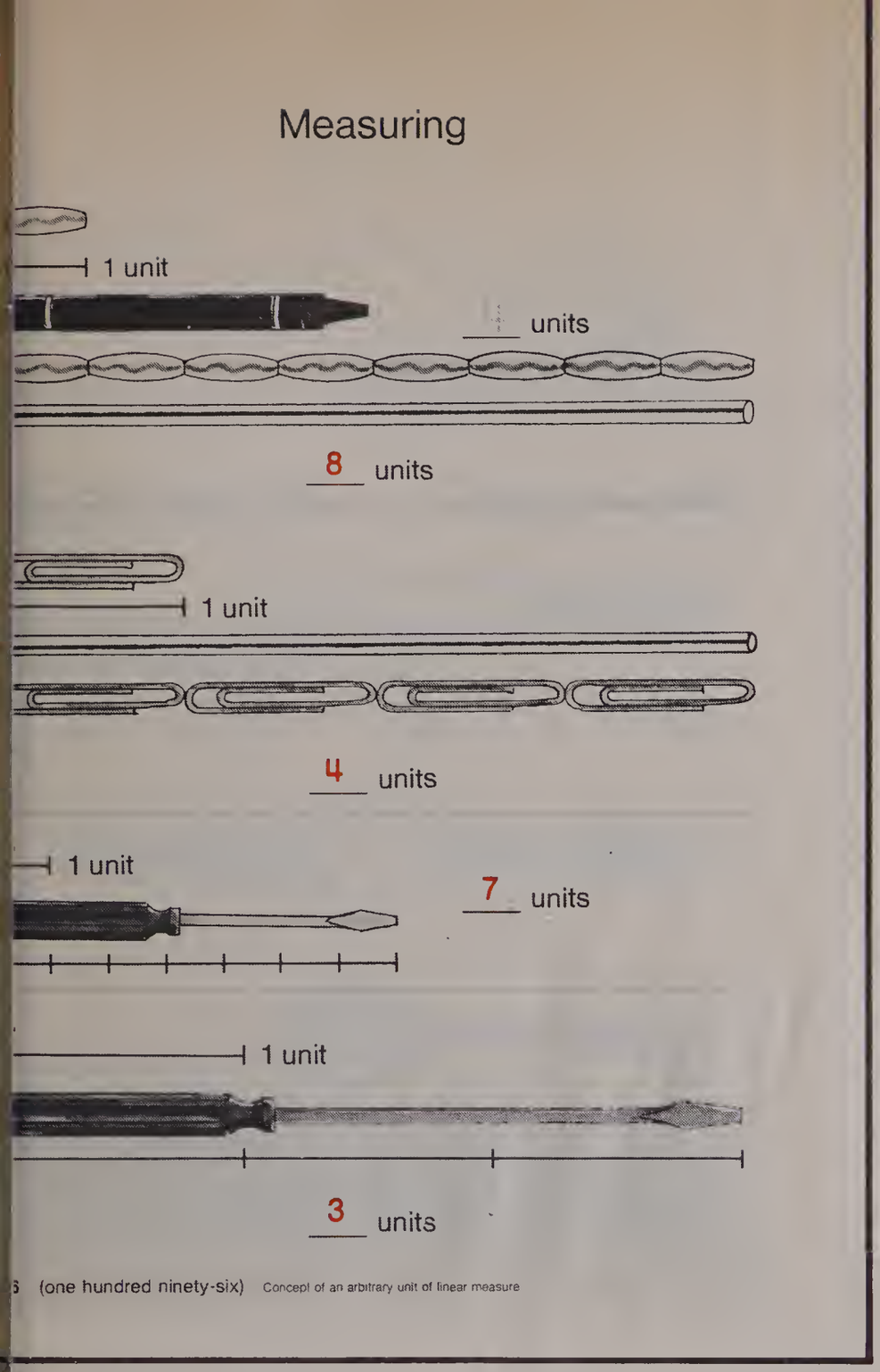
3. Give the child an object about 10 cm long. Blindfold the child and see if he or she can draw a line segment the same length.

RELATED AIDS

ACT. MASTERS—43.



Using the Book Have the child identify the objects: pencils, pens, straws, and line segments. You may have to assist the child in reading the instructions in each panel.



sing the Book Panel 1: Explain to the child that the length of one bead is ıe same as one unit. Call attention to the string of beads between the crayon ıd the straw. Have the child tell how many units long the crayon is and then ıe straw.

Panel 2: Be sure the child understands that the unit of measure in this ınel is a paper clip. You might call attention to the straw in panel 1 and the raw in panel 2 when the child is finished measuring. Ask, "Are the straws e same length? (yes) Why did we get different numbers in panel 1 and panel ? (because the units are not the same length)"

Panels 3-4: When the child is finished measuring, ask, "Why is the screw-iver that is 7 units long shorter than the screwdriver that is 3 units long? ecause the units are different lengths)"

OBJECTIVES

To find lengths using arbitrary units

PACING

Level A	All (1-2 guided)
Level B	All (1-2 guided)
Level C	All (1-2 guided)

VOCABULARY

unit of measure, units

MATERIALS

eraser

SUGGESTIONS

Initial Activities 1. Select two objects on opposite sides of the room. For example, choose an edge of a table and a windowsill. Ask, "How can we find which is longer?" Guide the child to conclude: (a) The objects *cannot* be placed side by side. (b) A shorter, movable object may be used and placed end-to-end along each object.

2. Have the child place an eraser end-to-end along each object and tell how many "erasers long" each object is and which object is longer. Explain that the eraser was used to measure each object and the length of the eraser was the *unit* used in measuring each object.

ACTIVITIES

1. Have the child find the length of a table using a pencil as the unit of length.

2. Have the child find the length of the table used in the activity above using a piece of chalk as the unit of length.

3. Ask the child to explain the difference in the two measures, in the activities above, of the same table. (The measures are different because the units of measure are different lengths.)

RELATED AIDS

ACT. MASTERS—44, 45.

OBJECTIVE

To find lengths to the nearest centimetre

PACING

Level A	197 All (1 guided)
	198 All
Level B	197 All (1 guided)
	198 All
Level C	197 All (1 guided)
	198 All

VOCABULARY

centimetre, centimetres

MATERIALS

card strips 1-16 cm long

SUGGESTIONS

Initial Activity If a centimetre ruler is not available, have the child cut out the centimetre ruler at the bottom of page 231 and paste it on a card strip. Keep for later.

Explain that the numeral by each mark tells how many centimetres that mark is from the zero or left end. Guide the child in finding the length of several objects 16 cm or less.

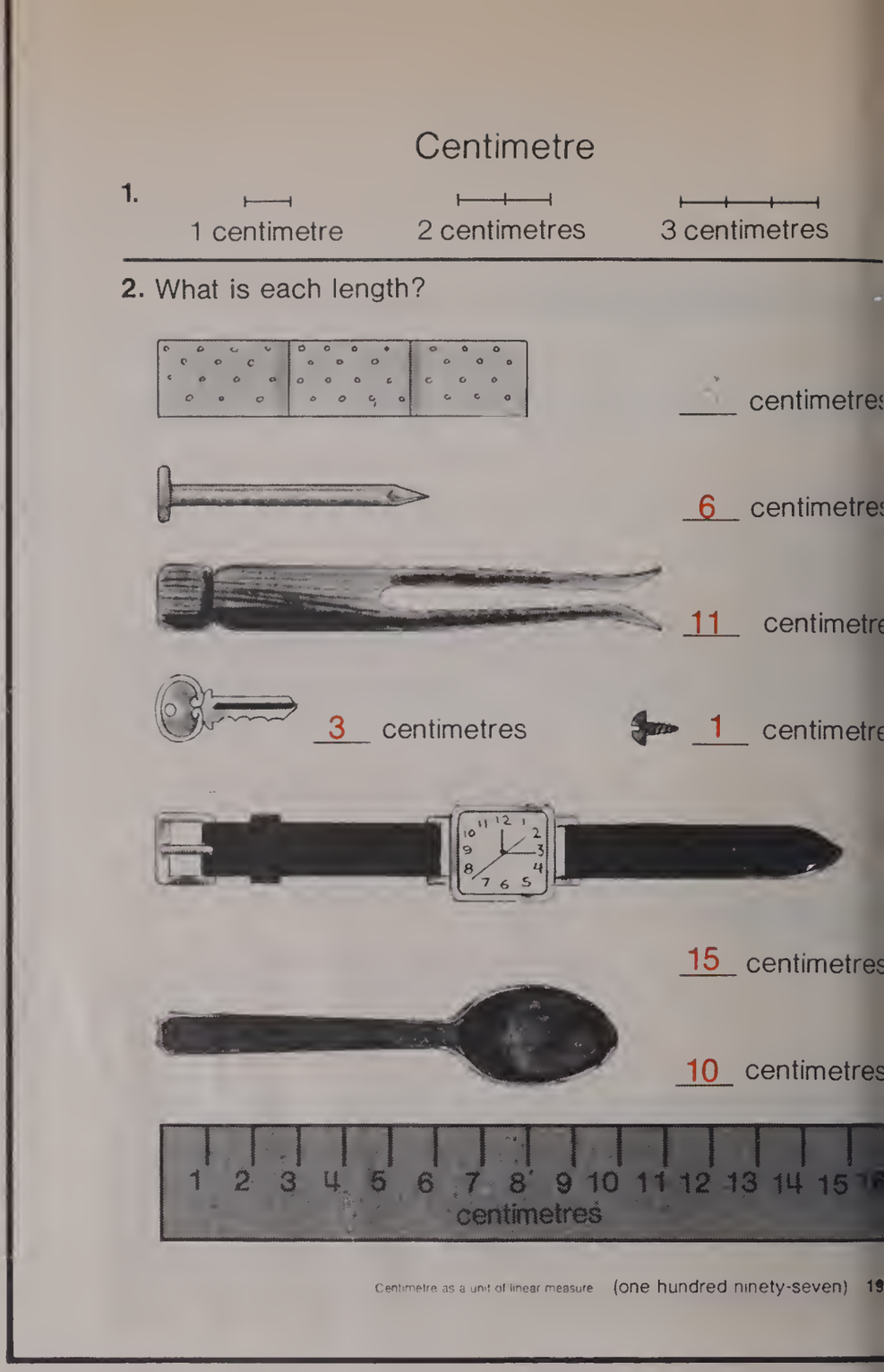
ACTIVITIES

Initial Activity If a centimetre ruler is not available, have the child cut out the centimetre ruler at the bottom of page 231 and paste it on a card strip. Keep for later.

1. Explain that the numeral by each mark tells how many centimetres that mark is from the zero or left end. Guide the child in finding the length of several objects 16 cm or less.

2. Give the child something to measure which is close to 5 cm long. The end of the object and the 5 cm mark on a ruler should not match. Stress that the end of the object is closer to 5 than to 4 or 6 so we say the object is about 5 cm long.

3. Have the child find lengths of objects in the classroom to the nearest centimetre. Use erasers, pencils, chalk, etc.



Using the Book If the child has a centimetre ruler, it may be used. If not, the child should cut out the centimetre ruler at the bottom of the page. The child should keep the ruler for the following lessons. Make certain the child places the ruler correctly along each picture to be measured.

Panel 1: Explain that the unit of length is called a centimetre. Ask the child to look at the first line segment. Have the child put his/her thumb and forefinger one centimetre apart. Then have the child identify the segment that is 2 cm long and finally the segment that is 3 cm long.

Panel 2: Tell the child to use the centimetre ruler, find the length of each picture, and write the number of centimetres in the correct blank. Have the child guess the length of each object before it is measured.

Special Note: In grade 2, the metric symbols are not used—rather the words are used. However, in the Teacher Notes the correct form of the numeral and symbol are used, i.e., 6 cm.

Using the Book If the child has a centimetre ruler, it may be used. If not, the child should cut out the centimetre ruler at the bottom of the page. The child should keep the ruler for the following lessons. Make certain the child places the ruler correctly along each picture to be measured.

Tell the child to use the centimetre ruler, find the length of each picture, and write the number of centimetres in the correct blank. Have the child guess the length of each object before it is measured.

ACTIVITIES

1. Show card strips 16 cm and less. Have the child guess and then find the length of each strip.

2. Ask the child to use the straightedge and draw a line segment that he or she thinks is 12 cm long. Then use a ruler to check the guess.

3. Show card strips with lengths 9 cm, 16 cm, 30 cm, 25 cm, and 32 cm. Have the child guess the length of each strip and then find the actual length in centimetres.

4. Some children may enjoy making a graph to show objects that they measured.

5. Provide the children with pictures of various shapes (rectangle, square, pentagon) and have them measure the length of each side of the figure.

6. Have the child compare the lengths of the objects on pages 197 and 198 and tell which is longest, shortest, same, etc.

RELATED AIDS

ACT. MASTERS—46, 47.
BFA PROB. SOLVING I—205, 206.

OBJECTIVES

To find lengths to the nearest centimetre
To find lengths in metres and centimetres

PACING

Level A	199 All (1-6 guided)
	200 All (1-3 guided)
Level B	199 All (1-3 guided)
	200 All (1 guided)
Level C	199 All (1 and 5 guided)
	200 All (1 guided)

VOCABULARY

metre, metres

MATERIALS

centimetre ruler, card strips, Scotch tape

BACKGROUND

See Item 6 in the Chapter Overview Background.

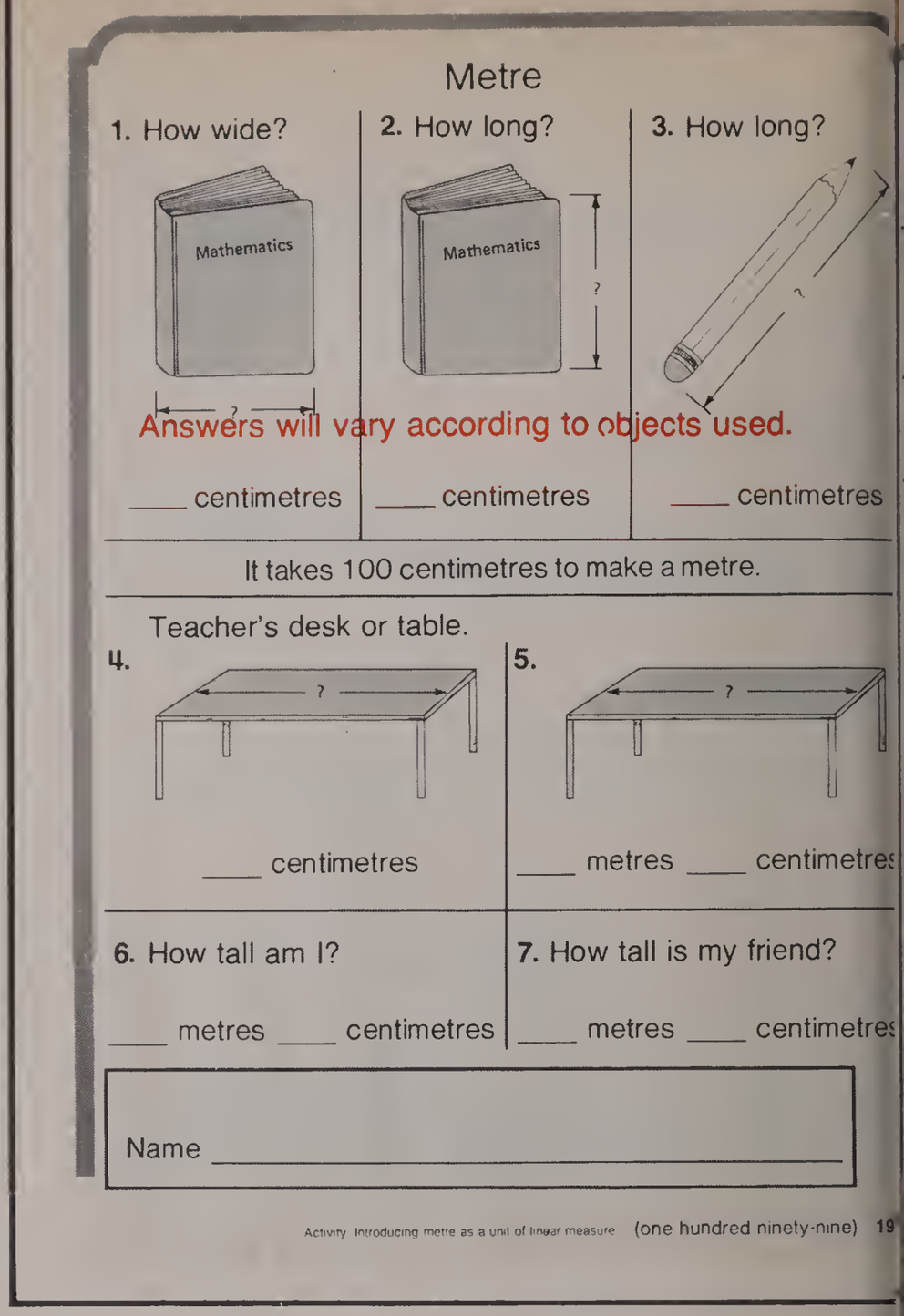
SUGGESTIONS

Initial Activities 1. Have the child cut 10 strips from cards, each 10 cm long. (The child may use the centimetre ruler from page 197.) Then tape the 10 strips end to end with Scotch tape, and find the length of the strips by counting by tens. The child may write 0 at the left end, 10 at first joint, 20 at second joint, and so on. Tell the child the taped strip is one metre long. Call the strip a metre measuring stick. Ask, "How many centimetres are in a metre? (100)"

2. Have the child measure the lengths of some objects that are longer than 1 m. For each object you may write: ____ metres and ____ centimetres. When a length is, for example, between 2 m and 3 m, the child may use the centimetre ruler to find the number of centimetres more than 2 m.

3. Show the child a metre stick marked in centimetres. Say, "This is a metre long. How many centimetres long is it?" Have the child use the metre stick to find the length of the room, and of objects in the room.

Special Note: At this early stage of introduction we will use the form "2 metres" instead of the SI metric form "2 m". This SI metric usage will be introduced in grade 3.



Using the Book This is an activity page. The child will need a centimetre ruler and a metre stick for this activity. (You might want to have the child make a centimetre ruler longer than the cutout on page 197.) See Initial Activities in side column.

Panels 1-2: Tell the child each picture shows what part of the math book is to be measured. Assist the child in putting the ruler on the correct edges of the book. Make sure the book is closed.

Panel 3: Have the child find the length of a pencil in centimetres.

Panels 4-5: Show a metre stick. Explain that 100 cm make 1 m. Have the child find and record the length of a table in centimetres. Since the centimetre unit is small, the child will get a large number. Explain that this is why we use a larger unit of measure. For panel 5, tell the child to use a metre stick and find the measure in metres and centimetres, such as 2 m and 10 cm. Use a metre stick and a centimetre ruler for measures beyond one metre.

Panels 6-7: Tell the child to find his or her height and a friend's height in metres and centimetres. Again, use a metre stick and a centimetre ruler for measures beyond one metre.

1. How many centimetres long is your book? ____ centimetres

Use your ruler to measure these things. **Answers may vary.**

2. ____ centimetres

3. ____ centimetres

4. ____ metres

5. metres

6. metres

7. metres

8. metres

9. metres

10. metres

Using the Book This is an activity page. Have the child use a ruler marked in centimetres.

Panel 1: The child may find the answer by measuring the book.

Panels 2-10: For this activity, each picture, except for the car, shows something that may be found in the classroom: an eraser, a shoe, the length of a boy's outstretched arms, a chalkboard, the length or width of the teacher's desk, a girl lying flat on the floor, the length or width of the room, and a baseball bat. A car may be found in the parking lot. The child should give each length to the nearest centimetre or to the nearest metre. Have the child estimate each length before the object is measured. Answers may vary considerably from child to child, especially for the long objects; therefore appropriate answers should be accepted.

EXTRA PRACTICE

Tell the child to add or subtract.

1.	32	56	27	44	62
	+45	+33	+51	+55	+27
2.	341	342	402	402	
	+245	+156	+306	+130	
3.	451	230	546	904	
	+ 23	+548	+ 32	+ 82	
4.	98	56	79	84	78
	-23	-34	-25	-53	-54
5.	876	716	808	659	
	-435	-405	-307	-443	
6.	764	594	874	642	
	- 32	-260	- 72	- 42	

ACTIVITIES

1. Have the child guess the length of the room to the nearest metre and then use a metre stick to find the length to the nearest metre.

2. Involve the child in Bulletin Board suggestion 2 in the Chapter Overview.

3. Have the child guess the length of the hallway, then get a metre tape and measure the hallway.

RELATED AIDS

ACT. MASTERS—46, 47.
BFA PROB. SOLVING I—205, 206.

OBJECTIVES

To compare liquid measures using nonstandard units

PACING

Level A All (1-6 guided)
Level B All (1-6 guided)
Level C All (1-6 guided)

MATERIALS

drinking glass, various containers

SUGGESTIONS

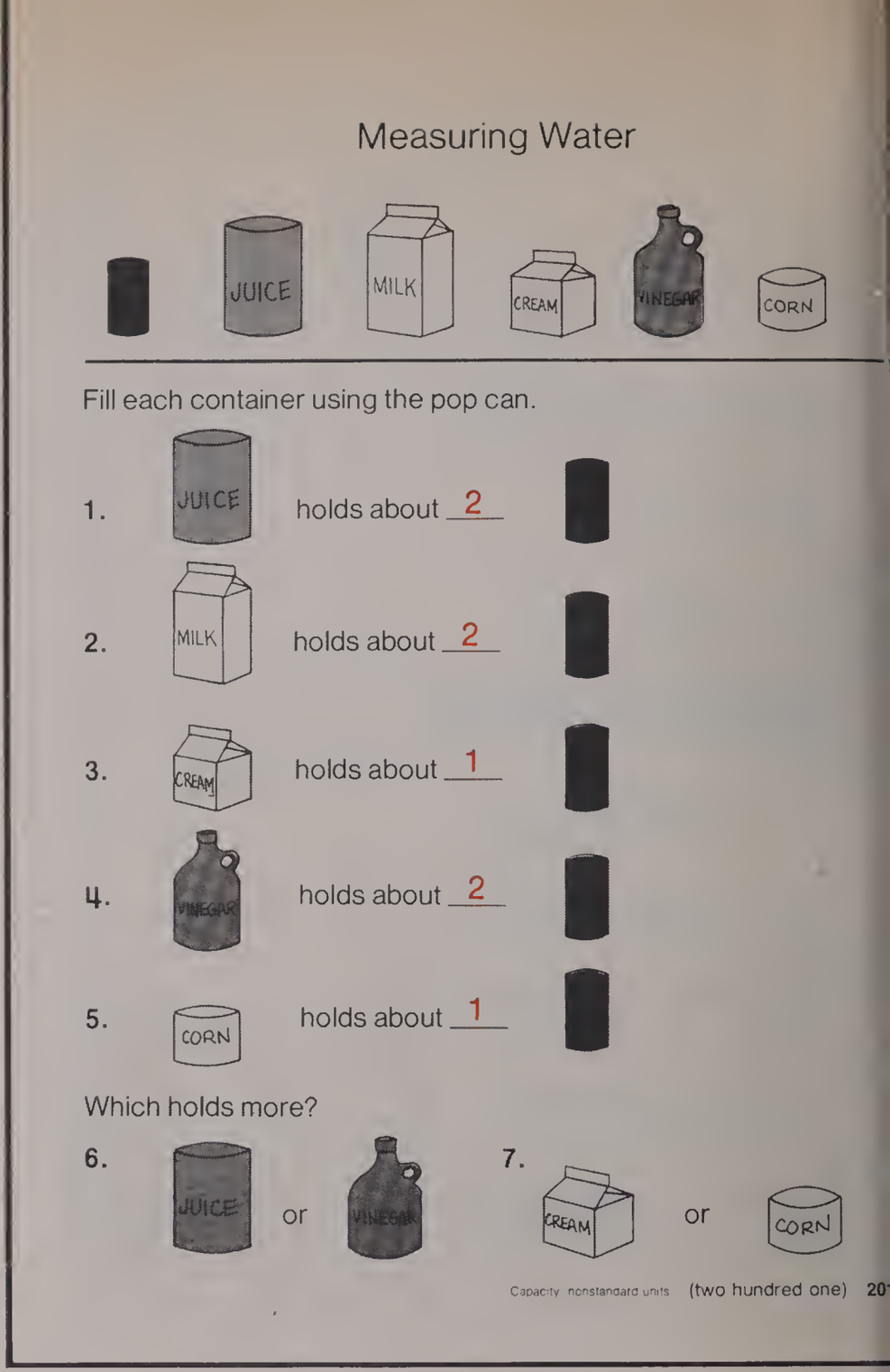
Initial Activities 1. Show the child a number of containers of various sizes and shapes. Give the child a drinking glass to fill the various containers with water. Before filling the containers have the child estimate the number of glasses of water each container will hold. Fill the glass with water and pour into containers, counting the number of glasses used for each.

2. Using various sizes and shapes of containers have the child select two of them and tell which holds more. Then have the child fill one container with water and pour into the other container.

ACTIVITIES

1. Group several children so they can apply what they have learned. Let the group choose a flavor of Instant Pudding to make in class. Some children may wish to write stories about their cooking experiment.

2. Display paper as well as glass containers to help the child generalize that containers which hold the same amount of liquid may be different shapes. One container may be shaped like a can and another may be shaped like a box.



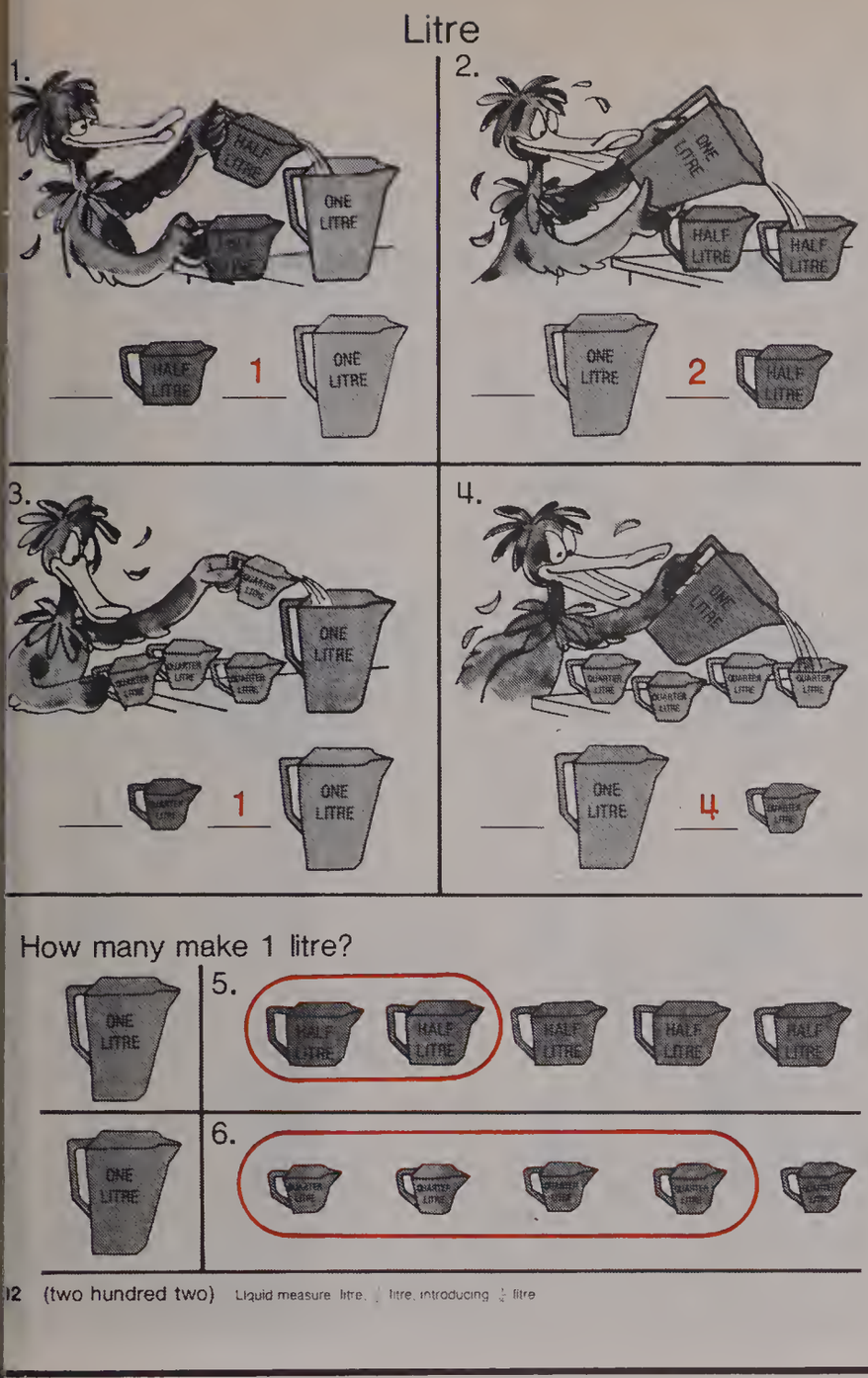
Using the Book Discuss with the child that liquid containers come in all shapes and sizes and that many different liquids come in these containers. Show the child a variety of containers. Discuss what the containers hold and whether or not the containers are large or small in relation to one another.

Panel 1: Compare the size of the pop can and the juice can by holding them side by side. Have the child guess how many pop cans of water it will take to fill the juice can. Then fill the juice can by pouring cans of water from the pop can into it. Count the number of cans and record in the blank space.

Panels 2-5: Use the pop can to fill each of the containers. Record the answer in the blank space.

Panel 6: Have the child compare the size of the juice can to that of the vinegar bottle. Ask, "Which do you think holds more?" Fill one of the bottles with water and pour into the other to check answer.

Panel 7: Use the same procedure as for panel 1.



Using the Book The child may use the appropriate containers and coloured water to find or verify each answer.

Panels 1-2: For panel 1, ask, "How many half litres of milk is Plat Flat using to fill the litre container? (2) How many half litres make 1 L? (2)" Have the child trace the 2 at the bottom of the panel. Assist the child in completing the other blank for the picture. Ask, "2 half-litres make how many litres? (1)" Have the child write 1 in the blank and read as: 2 half-litres will fill 1 L.

For panel 2, ask, "Plat Flat is showing the litre container of milk will fill how many half-litre containers? (2) What is Plat Flat saying? (Same amount) What does Plat Flat mean? (that 1 litre container holds the same amount as 2 half-litre containers and vice versa)" Have the child complete the blanks and read as: 1 litre will fill 2 half-litres.

Panels 3-4: Adapt the procedures for panels 1-2.

Panel 5: Have the child mark a set of half-litre containers that will hold as much as the litre container.

Panel 6: Have the child mark a set of quarter-litre containers that will hold as much as the litre container.

OBJECTIVE

To compare liquid measures: litre, half litre, quarter litre

PACING

Level A	All (1-6 guided)
Level B	All (1-4 guided)
Level C	All (1-4 guided)

VOCABULARY

litre, half litre, quarter litre

MATERIALS

containers: litre, half litre, quarter litre; water

BACKGROUND

A litre is a measure of capacity and is a little more than a quart.

SUGGESTIONS

Initial Activity Provide the child with water and the containers listed in Materials above. Assist the child in identifying each container. Have the child experiment to find how many half litres of water the litre container will hold. Repeat the activity using the litre and quarter-litre containers.

ACTIVITIES

1. Provide the child with a litre container and other containers of various sizes. For each container, have the child guess whether it holds a litre or more or less than a litre. Then the child uses water to check the guess.

2. Have the child collect clean containers whose contents were listed in litres or parts of a litre. Arrange them in a display from smallest to largest capacity.

3. The child may assist in making a poster displaying pictures of liquids in litre cans.

OBJECTIVE

To compare liquid measures: litre, half litre, quarter litre

To compare capacities of containers with a litre or part of a litre

PACING

Level A	All (guided)
Level B	All (1-2 guided)
Level C	All

MATERIALS

5 quarter-litre containers, one litre container, water

SUGGESTIONS

Initial Activity Show a set with 3 quarter-litre containers and a set with one litre container. Have the child guess which set holds more water. Use water to check the guess.

Repeat the activity using 5 quarter-litre containers and one litre container.

ACTIVITIES

1. Write:

____ quarter litres makes 1 litre
____ half litre makes 1 litre
____ quarter litres makes $\frac{1}{2}$ litre

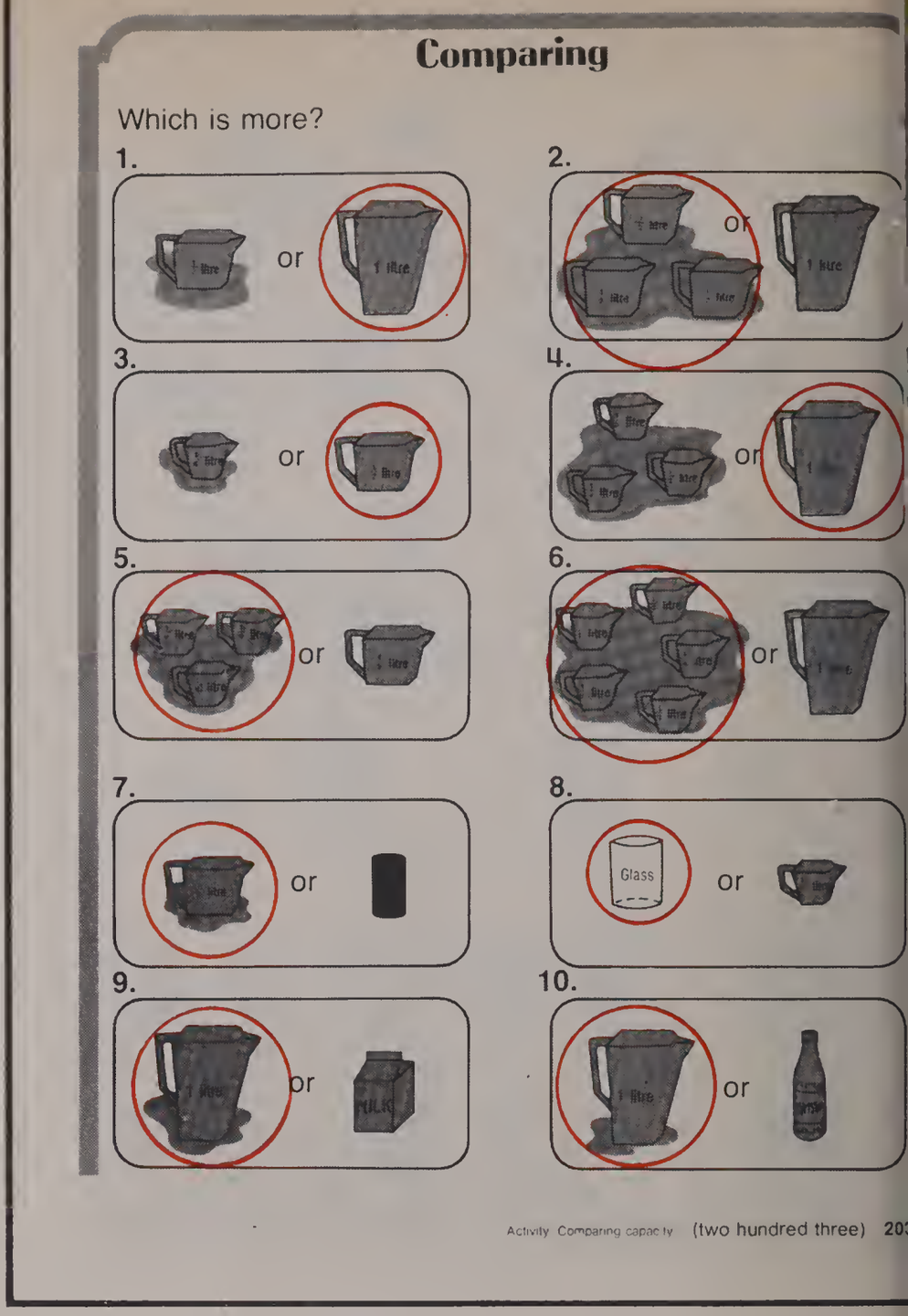
Give the child the appropriate containers and water and have the child experiment to complete the sentences. Draw containers if the child has reading problems.

2. Have the child find various kinds of containers similar to panels 7-10 on page 203. Then make pairs of sets and for each pair of containers the child experiments with, have the child tell which set holds more water, when compared to half litre, quarter litre, and one litre.

3. Write:

3 half litres or 1 litre
3 quarter-litres or 1 litre
1 half-litre and 1 quarter-litre or 1 litre

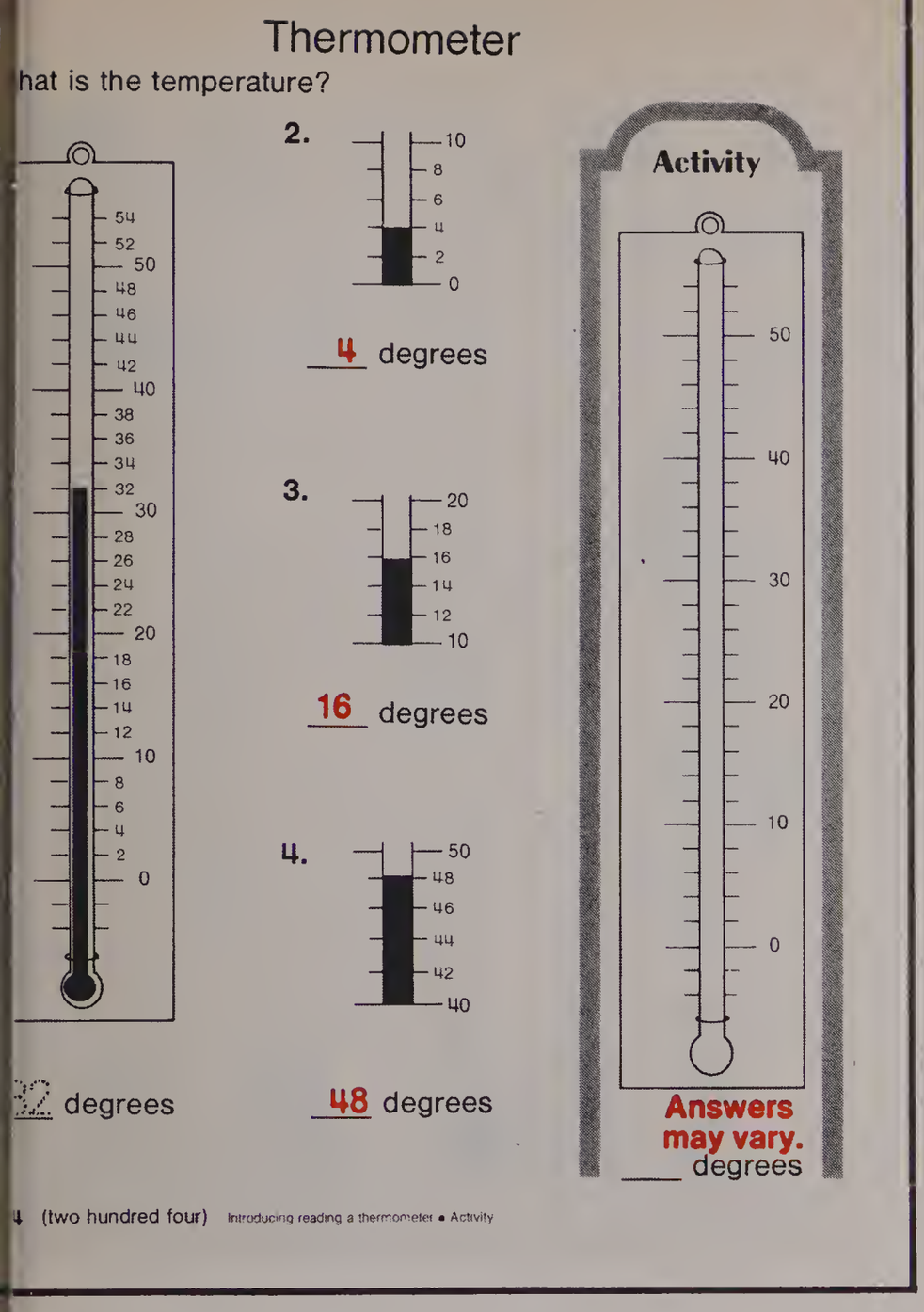
For each item have the child ring the set that holds more water. The child may use the appropriate containers to find or verify answers.



Using the Book This is an activity page. The child may use the appropriate containers and colored water to find or verify the answer in each exercise.

Panels 1-6: For each panel, have the child mark the container or set of containers that holds more water.

Panels 7-10: For each panel provide the child with the necessary containers. Then have the child find which container holds more water, and mark that container.



sing the Book Have the child use a pencil to touch each mark from 0 to 20. his will show the child that each mark on the thermometer represents 2 degrees.

Panels 1–4: Have the child read each thermometer and write the temerature.

Activity: For this activity, have the child read the classroom thermomer and write the temperature at the bottom of the page. Then have the child se a red crayon and draw a mark on the thermometer at the right to show this mperature. (If there is no classroom thermometer, have the child use that ay's temperature.)

OBJECTIVE

To read a thermometer

PACING

Level A	All (guided)
Level B	All (1 guided)
Level C	All (1 guided)

VOCABULARY

thermometer, temperature, degrees

MATERIALS

demonstration and real thermometers

SUGGESTIONS

Initial Activity Use a large demonstration thermometer and show the marks on it. Tell the child the long marks are for every 10 degrees. Set the demonstration thermometer for various readings (multiples of 2) and have the child give the temperature for each setting.

ACTIVITIES

1. Review counting by twos through 100.

2. Have a thermometer outside the window, have the child record the temperature at the same time each day for 2 or 3 weeks.

3. Involve the child in Bulletin Board suggestion 3 in the Chapter Overview.

RELATED AIDS

ACT. MASTERS—48.

OBJECTIVE

To compare the mass of objects using nonstandard units

PACING

Level A	All
Level B	All
Level C	All

VOCABULARY

scale, mass, balance

MATERIALS

balance, masses, objects, lighter

SUGGESTIONS

Initial Activities 1. Have the child estimate which of the small objects (in pairs) has the greater mass, by holding one in each hand. Then have the child place the objects on a balance to check the accuracy of the guess. You may have to discuss (or review) how to tell which object has the greater mass.

2. Give the child an object to place on one side of a balance. Then, tell the child to find some other objects to place on the other side of the balance. Place enough objects on the balance until the two sets of masses are approximately equal. Discuss the mass of each object as being greater or less than one of the objects.

ACTIVITIES

1. Form two teams. Have a member of one team select some object. Then have a member of the other team select a second object. The first team member guesses whether the second team's object has more or less mass than his own. Use a balance to check the answer. Score one point for each correct guess.

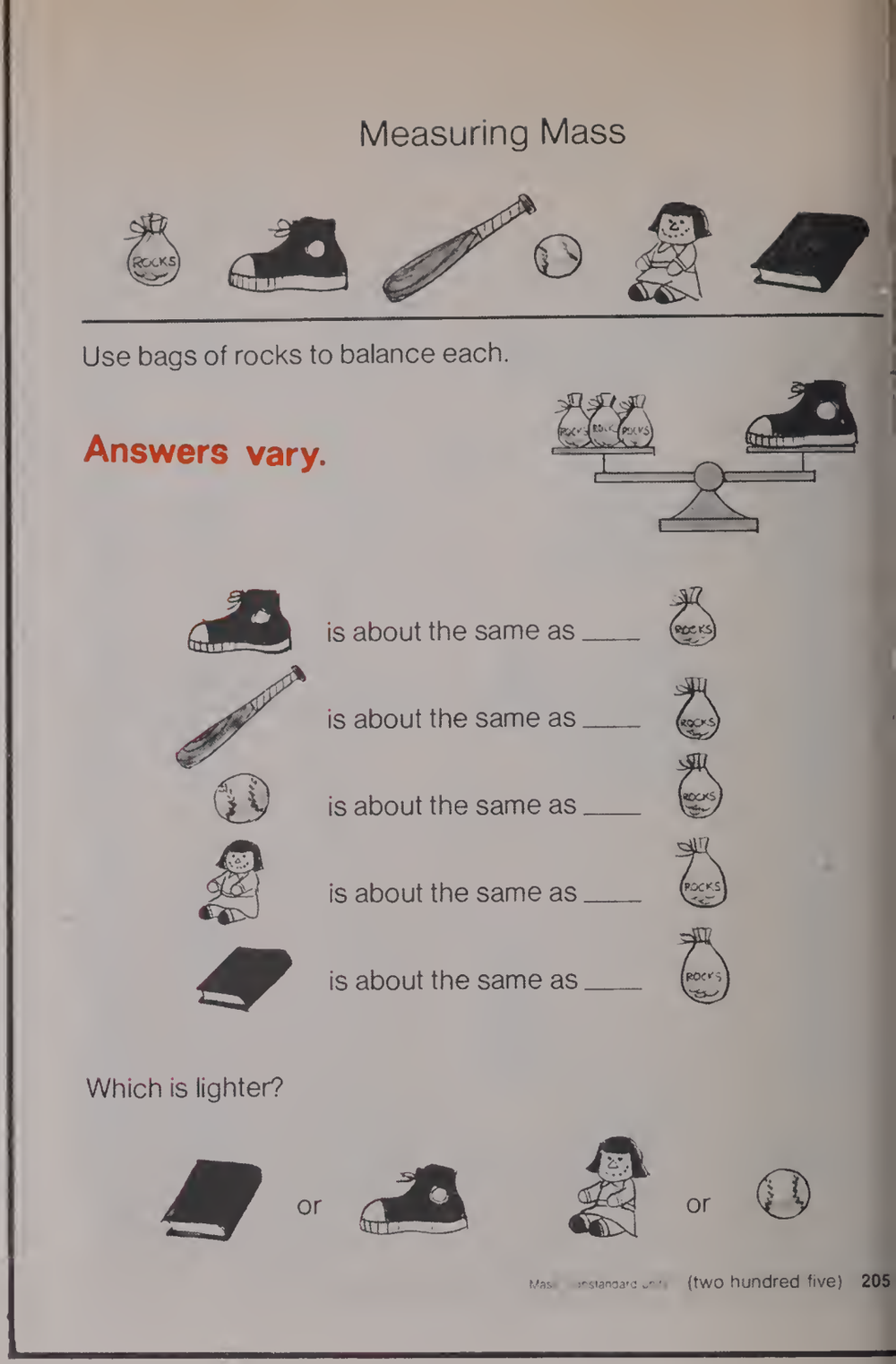
2. Expand the initial activities to demonstrate that size and shape do not always determine the mass.

3. Have children find a small object with the greatest mass and a large object having less mass. Discuss why the masses are different. (type of material)

4. A simple balance can be made by tying a string around the middle of a metre stick and suspending objects from each end of the stick.

RELATED AIDS

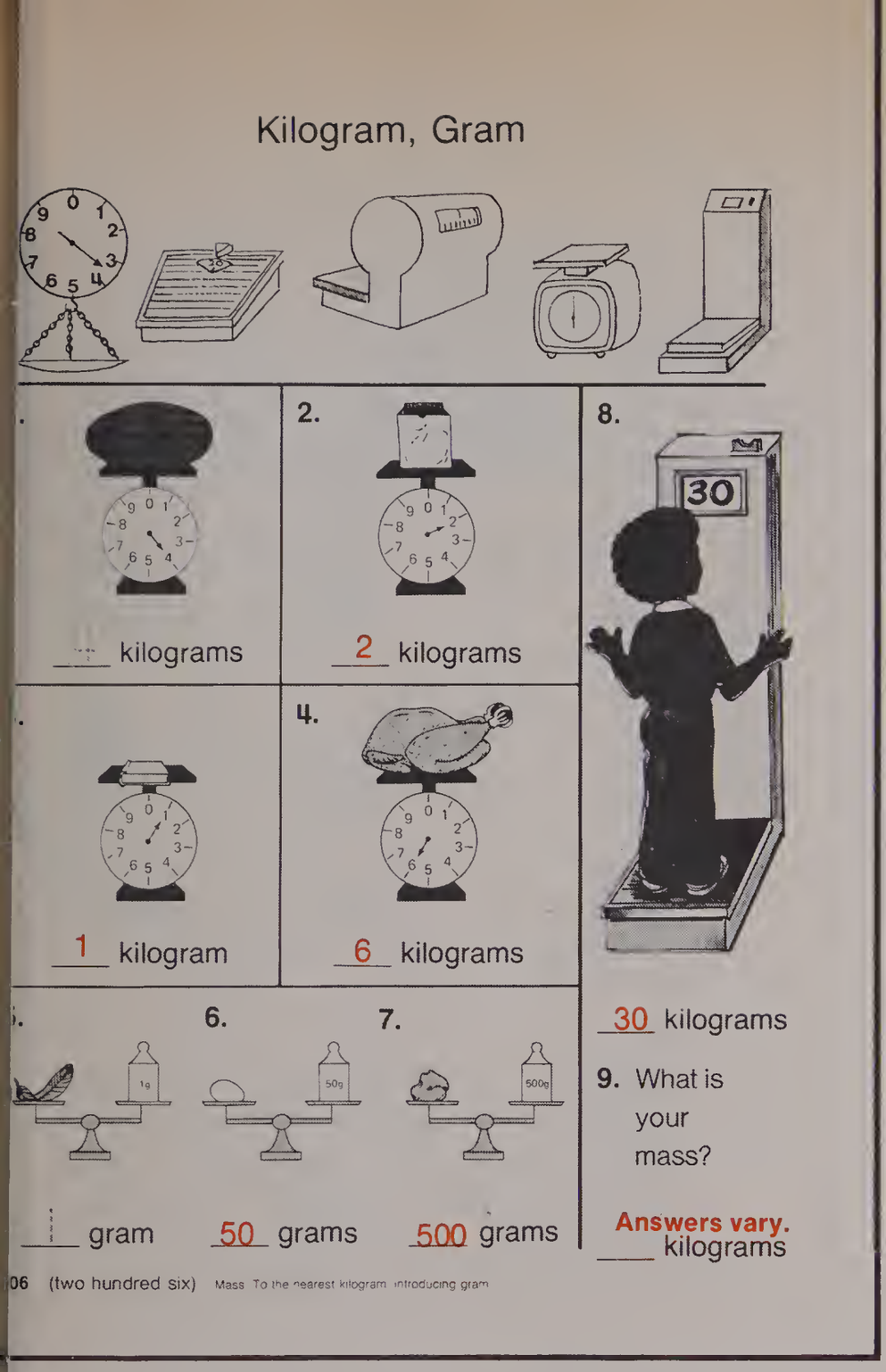
ACT. MASTERS—49.



Using the Book Have the child identify objects at the top of the page and talk about their masses. Ask "Which do you think has the greatest mass? Which one has less mass?" Tell the child it is possible to determine the mass by using a balance. Explain the balance, and the way of telling which of the two objects on the balance has the greater mass.

Panel 1: Put a running shoe on one side of the balance. Say, "Put bags of rocks on the other side of the balance until the two sides are equal." Have the child fill in the number of bags of rocks it takes to make the scale balance. Repeat the procedure for the other objects.

Panel 2: Ask, "Which has the least mass? How can we find out for sure?" (use balance) Then have the child put an X on the object having the least mass of each pair.



Using the Book Discuss the scales at the top of the page. See if the child can tell where each type of scale may be found. (butcher shop, bathroom, grocery store, kitchen or fruit stand, doctor's office or a pay scale in stores, and so on)

Panels 1-4: Have the child give each measure to the nearest kilogram.

Panels 5-7: Explain something about a balance scale. An object is placed on one pan and a mass on the other. When the arm is straight across, that is, the object balances the mass, then the mass tells what the mass of the object is. Have the child tell the mass of each object.

Panel 8: Have the child tell the mass of the boy in kilograms.

Panel 9: Have the child use a scale to find his or her mass to the nearest kilogram.

OBJECTIVE

To find mass to the nearest kilogram or gram

PACING

Level A	All (1, 7, 8 guided)
Level B	All (1, 5, 8 guided)
Level C	All (7-8 guided)

VOCABULARY

kilogram, gram, scale, weigh, balance, mass

MATERIALS

scale, balance, gram, masses, objects to weigh

BACKGROUND

1000 g = 1 kg.

SUGGESTIONS

Initial Activity Using a kilogram scale, have the child find the masses of common objects to the nearest kilogram. Then use a balance scale and experiment with gram masses to balance objects that have masses of 50 g, 300 g, and 600 g.

ACTIVITIES

1. Let pairs of children participate in finding the masses of themselves and their friends in kilograms.

2. Have the child experiment to find different masses in grams and kilograms. The child may use a balance scale and kilogram masses.

3. Have the child place a kilogram mass on one side of a balance scale. Then the child places gram masses (200, 300, 500) on the other side until the sides balance. Ask, "How many grams make a kilogram? (1000)"

RELATED AIDS

ACT. MASTERS—49.

OBJECTIVE

To find mass to the nearest kilogram

PACING

Level A	All (1, 7-8 guided)
Level B	All (1, 7-8 guided)
Level C	All (7-8 guided)

MATERIALS

scale, objects to weigh, balance

SUGGESTIONS

Initial Activities 1. Use a demonstration scale and some common objects. Assist the child in finding the mass of each object and telling its mass to the nearest kilogram.

2. Have the child use a balance. If you do not have masses of 1, 2, 3, and 4 kg, use containers filled with the appropriate amount of sand, then label. Then use the masses and objects that have a mass of 1, 2, 3, and 4 kg. The child puts an object on one end of the balance and finds the correct mass to put on the other end.

ACTIVITIES

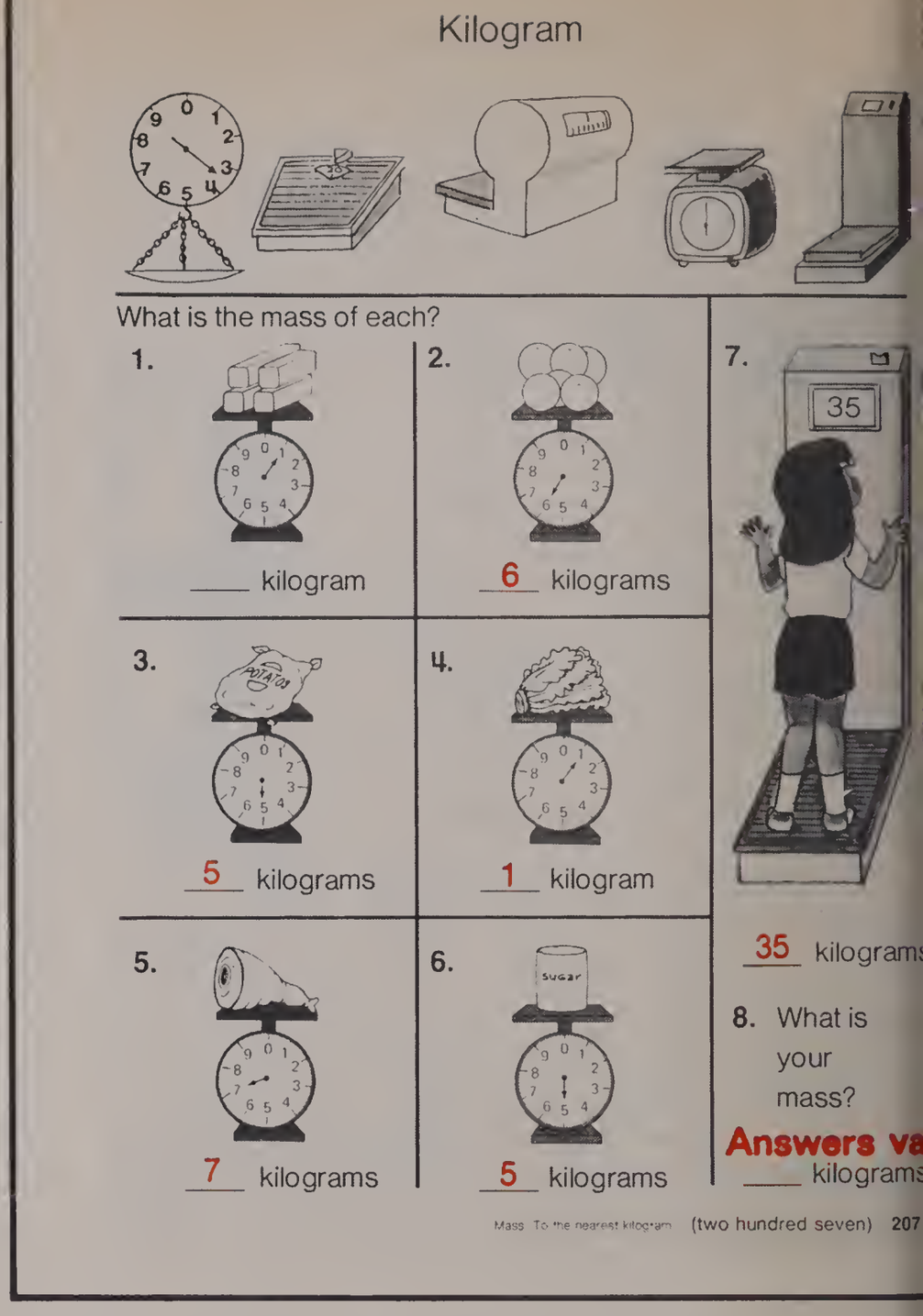
1. Provide objects that have a mass of 5 kg or less. Guess the mass of each object and then check it.

2. Have the child find his or her mass and a friend's mass to the nearest kilogram.

3. Provide the child with objects that have a mass of five or more kilograms each. Guess the mass of each object and then find its actual mass.

RELATED AIDS

ACT. MASTERS—49.



Using the Book Discuss the types of scales and where they may be found. (butcher shop, bathroom, grocery store, kitchen or fruit stand, doctor's office or a pay scale in stores)

Panels 1-6: Have the child give the mass in kilograms for each panel.

Panel 7: Tell the child to give the mass of the girl.

Panel 8: Provide the child with a scale to find his or her mass to the nearest kilogram.

first week	42 ponds
second week	30 ponds
third week	25 ponds

Add.

	tens	ones
	4	2
	3	0
+	2	5
	9	7

$$\begin{array}{r} 42 \\ 30 \\ +25 \\ \hline 97 \end{array}$$

2. Add.

$$\begin{array}{r} 35 \\ 50 \\ +12 \\ \hline 97 \end{array} \qquad \begin{array}{r} 12 \\ 35 \\ +41 \\ \hline 88 \end{array} \qquad \begin{array}{r} 51 \\ 34 \\ +10 \\ \hline 95 \end{array} \qquad \begin{array}{r} 23 \\ 40 \\ +15 \\ \hline 78 \end{array} \qquad \begin{array}{r} 16 \\ 31 \\ +42 \\ \hline 89 \end{array}$$

$$\begin{array}{r} 11 \\ 67 \\ +20 \\ \hline 98 \end{array} \qquad \begin{array}{r} 13 \\ 10 \\ +61 \\ \hline 84 \end{array} \qquad \begin{array}{r} 32 \\ 32 \\ +32 \\ \hline 96 \end{array} \qquad \begin{array}{r} 23 \\ 54 \\ +21 \\ \hline 98 \end{array} \qquad \begin{array}{r} 30 \\ 16 \\ +30 \\ \hline 76 \end{array}$$

208 (two hundred eight) Column addition [illegible] and ones, no regrouping

Using the Book This is a career page. See Careers in Chapter Overview. The child may have seen forest rangers on television. You might explain that one of the many things the Forest Service does is provide watering places by digging holes.

Panel 1: For this panel, begin by telling a story: "Many ponds were built in the forest. The ponds were for birds and animals. How many ponds were built in all?" Then have the child look at the sign on the post. Ask, "How many ponds were built the first week? (42)" Then direct the child to the place value chart (tens and ones) and finally to the short form on the right. Proceed in this manner until you have discussed all three addends. Then have the child find the answers, first for the long form and then the short form.

Panel 2: Have the child add.

OBJECTIVE

To add three addends, using two-digit numerals

PACING

Level A (Initial Activities only)
Level B All (1 guided)
Level C All (1 guided)

MATERIALS

9 full ten-boxes, 9 blocks

SUGGESTIONS

Initial Activity This is a career page. Before discussing the page you may want the child to relate an experience in a forest or with forest rangers. Ask the child how forest rangers work with other people. (See Chapter Overview on how their work involves people.)

Write a problem: "John has 31 blocks. Bill has 43 blocks. Tom has 24 blocks. How many blocks do the boys have in all?" Ask, "What can you do to find the answer?" Dramatize the problem by having the child use blocks. Write the exercise using the place value chart and two-digit numerals, as in Panel 1. Have the child find the sum in both forms.

ACTIVITIES

1. Have the child cut pictures of forest scenes from magazines, etc.

2. Have the child use pictures collected in the activity above to create problems.

3. Have a forest ranger visit the class. Discuss safety in forests.

RELATED AIDS

ACT. MASTERS—Gen. Use 5, 6.
BFA COMP LAB I—32.
BFA PROB. SOLVING I—175.

OBJECTIVE

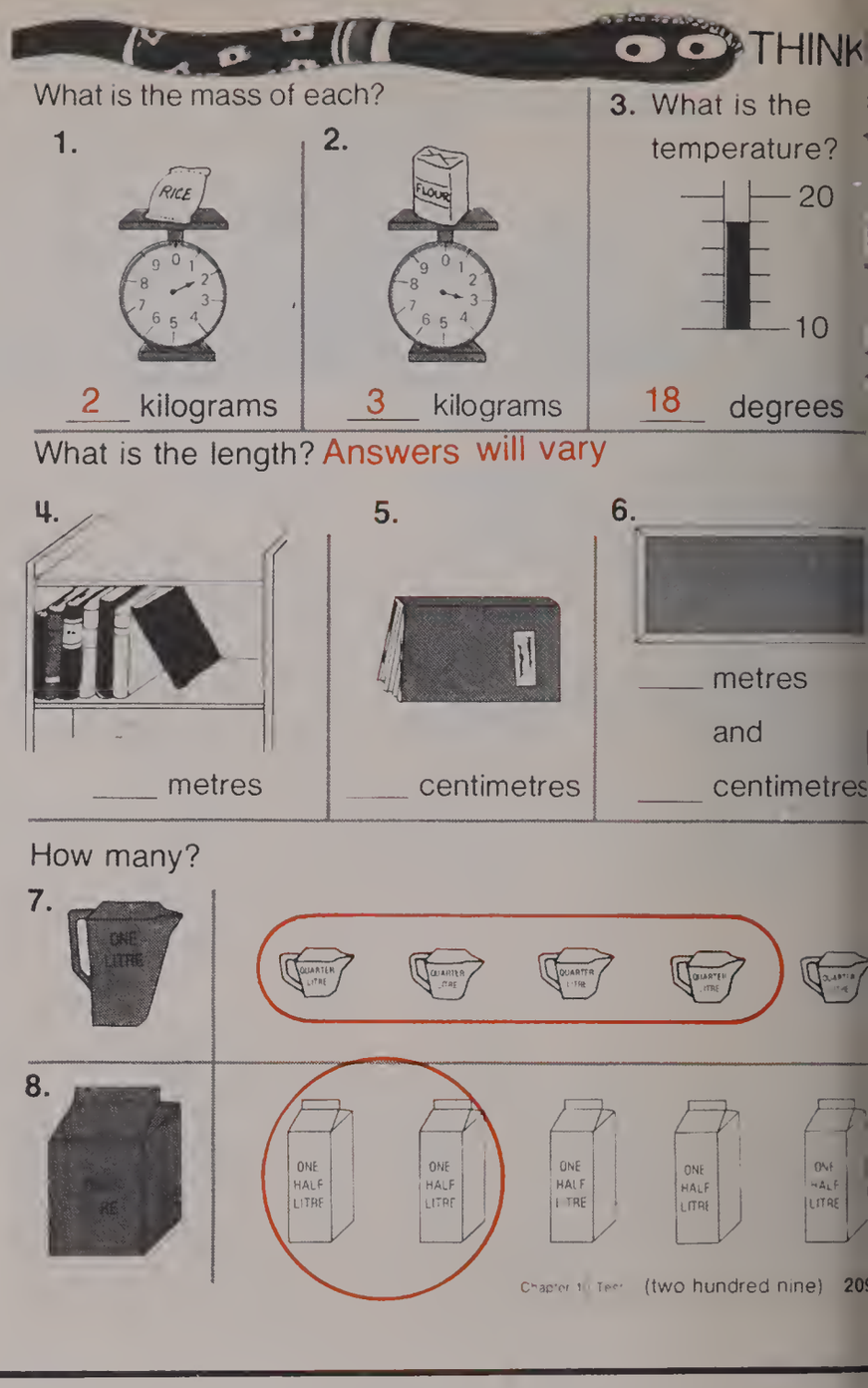
To evaluate achievement of the Chapter Objectives

PACING

Level A	209 All
	210 All
Level B	209 All
	210 All
Level C	209 All
	210 All

SUGGESTIONS

The Chapter Test is designed to be used in a diagnostic manner. It assesses the child's knowledge of the main concepts and skills that were taught in this chapter Some children should take this test independently with guidance for instructions only. Use judgment as to whether certain children should be guided through some or all of the exercises. Check each child's work and mark the items that are incorrect. Reteaching or extra practice might be necessary to help the child acquire the concept or skill that was missed. With this reteaching, you will be able to ascertain whether the child has then learned the topic in question. See Using the Book for page references indicating where the concept or skill was taught.



Using the Book This is a diagnostic test. The page references are given for reteaching as needed.

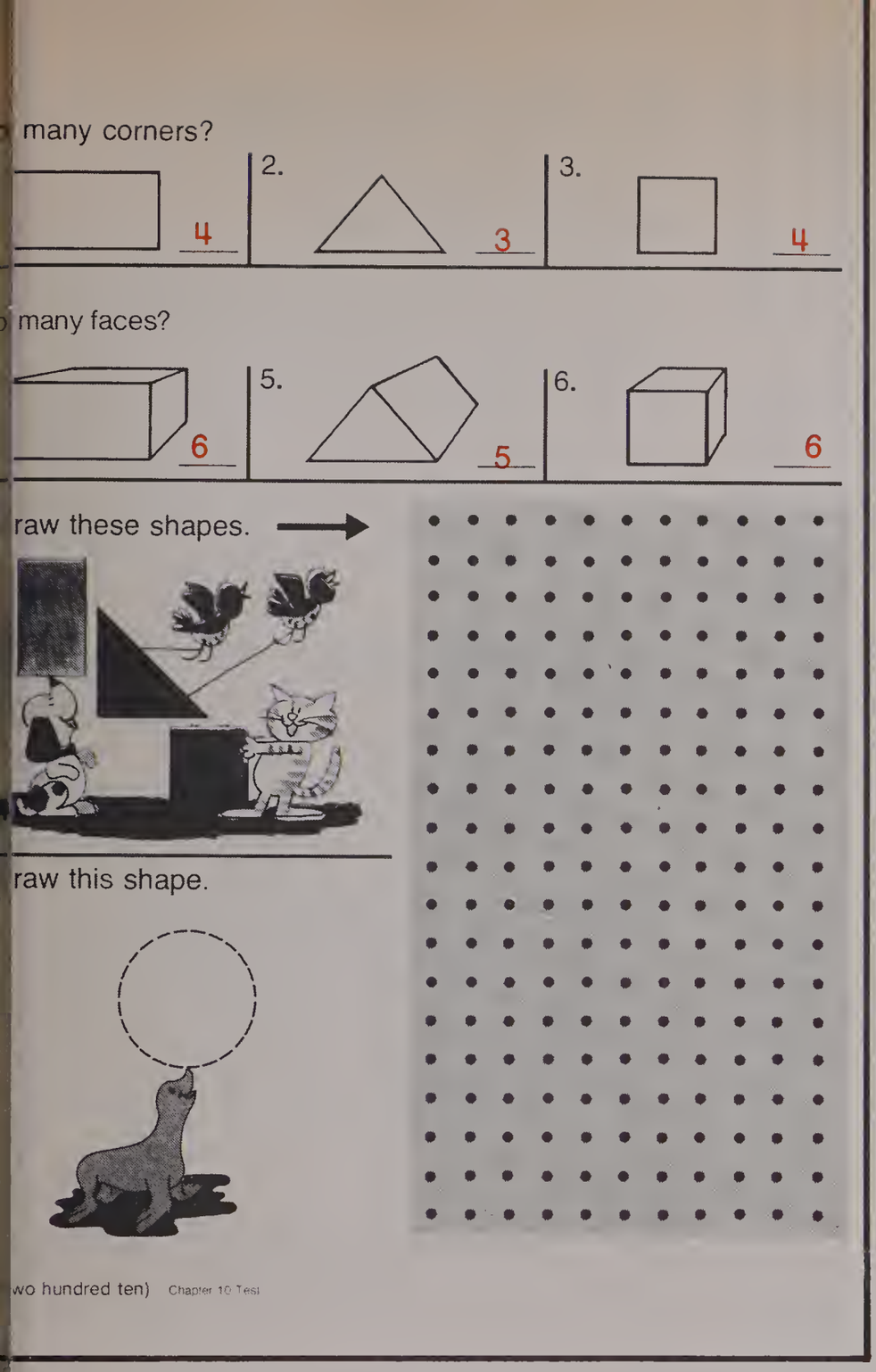
Panels 1-2: For each panel, have the child give the mass of the object. [pages 206-207 K]

Panel 3: Have the child give the reading on the thermometer. [page 204 J]

Panels 4-6: Have the child find the lengths of a bookshelf, a book, and a chalkrail or chalkboard in the classroom. [pages 197, 198 H, 199, 200 H]

Panel 7: Tell the child to ring a set of quarter-litre containers that will hold as much water as the litre container on the left. [page 202 I]

Panel 8: Tell the child to ring a set of half-litre cartons that will hold as much liquid as the litre carton on the left. [202 I]



ACTIVITIES

1. Cut out pictures of a ball, a box, a cone, and a can. Paste each picture on a can. Place the containers in a row on the worktable. The child looks at each picture, and then finds these shapes in magazines and newspapers. Have the child cut out the pictures, bring them to school, and put them in the appropriate can.

2. Show a real thermometer and have the child read the room temperature. Dip the thermometer in a pan of ice water for a second or two and have it read again. Put the thermometer back in the ice water until the temperature drops about 5 degrees, then have the child read it once more. Ask, "What happens to the temperature when we put it in cold water? (It drops or goes down.)"

3. Repeat Activity 1 above using warm or hot water depending on room temperature.

4. Provide an opportunity for estimating lengths. Have the child guess the length of objects such as tables, the room length, windowsills, and so on, in metres. Then the child should measure the object after each guess. The child may complete the activity first using metres and then centimetres.

5. Challenge the child to measure objects having width, height, and depth, such as a bookshelf, box, chair, etc.

sing the Book This is a diagnostic test. The page references are given for teaching as needed.

Panels 1-3: For each panel, have the child give the number of corners of ach figure. [pages 183, 184 E]

Panels 4-6: For each panel have the child give the number of faces of ach figure. [pages 190 E]

Panel 7: Tell the child to draw the shapes with which the animals are laying (a rectangle, a triangle, and a square). The child should use the dots s a guide. [189 B]

Panel 8: Tell the child to trace over the dashed marks to draw a circle. page 186 B]

CHAPTER 11 OVERVIEW

Regrouping in addition and subtraction, involving two-digit numerals, is introduced in this chapter. The child also encounters counting change for purchases less than one dollar. The art theme for this chapter is History.

OBJECTIVES

A To add ones to tens and ones with regrouping
B To add tens and ones with regrouping
C To subtract ones from tens and ones with regrouping
D To subtract tens and ones with regrouping
E To make change using subtraction

VOCABULARY

rename 211
change 226

BACKGROUND

1. On several pages involving renaming, we see no need to concern the child with drawn-out developments. For example, compare the renaming on page 211 (form A) with the development showing each step (form B). The form B is not used.

Form A	Form B
2 tens + 14 ones	2 tens + 14 ones
2 tens + 1 ten + 4 ones	2 tens + (1 ten + 4 ones)
3 tens + 4 ones	(2 tens + 1 ten) + 4 ones
	3 tens + 4 ones

2. Consider the following computations with regrouping:

1	1	312	710
37	46	47	80
+ 8	+29	- 7	-26
45	75	35	54

The auxiliary marks and numerals are often called "crutches." In developmental stages, crutches may aid the children in understanding each step, especially when each step is associated with activities with blocks and boxes. A more capable child may be encouraged to do away with the crutches after the developmental stages. However, you may find some children who need and depend on crutches. Without them these children may not succeed as well.

MATERIALS

9 full ten-boxes and 9 blocks
cards with number names such as 5 tens + 12 ones and 62
pennies, nickels, dimes, quarters
articles with price tags less than 40 cents
mini-problems on file cards
popsicle sticks

CAREER AWARENESS

Firefighters [222]

Most firefighters work full time for city fire departments. Many others are volunteers or private firefighters. Firefighting is very dangerous; organization and teamwork are required. Citizens should always follow the instructions of the firefighters.

The fire department also employs inspectors for checking buildings for fire hazards. Also, firefighters visit schools and civic groups to instruct the public in fire prevention.

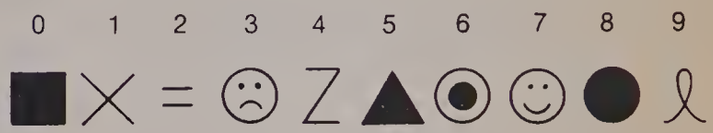
It is important that children develop an awareness of self and others. Children should realize that firefighters perform a service to the community. It is their expertise that saves lives. We should help firefighters as much as possible in doing their job and making it easier.

Photo description: On this winter day, firefighters struggle against adverse weather conditions to put out a fire. Sleet and ice often hinder firefighters in their work. Notice the ladder truck in the background.

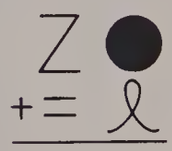
BULLETIN BOARD

1. The art theme for this chapter reflects certain aspects of our history as a developing nation. It should be exciting for the children to help create a bulletin board about Canadian history. For example, the art on page 215 suggests the wagon trains that traveled west. You may have the children draw or cut out pictures that focus attention on that part of our nation's history.

2. Focus a bulletin board around an arithmetic code. You may use any symbols you wish. The code shown below may be too sophisticated for some children and you may wish to replace these symbols with pictures of objects.



Then place exercises involving adding and/or subtracting tens and ones with regrouping in the code. For example:



(decoded) $\begin{array}{r} 48 \\ +29 \\ \hline \end{array}$

3. Tack three plastic bags to the lower edge of the bulletin board, and then find and display two other names for the number. You might hang up a three-minute egg timer and play a race-against-time game. The child empties all three bags, turns the egg timer over, and sees how many correct sets (three number names each) can be assembled before the sand runs out. Then the child's score can be recorded on a chart and displayed on the bulletin board. The next time, the same child can try to beat his/her previous score.

(bag A)	91
(bag B)	9 tens + 1 one
(bag C)	8 tens + 11 ones

SPECIAL NOTES

1. For the career on page 222, you might want to plan in advance to have a firefighter visit your class.

2. Color is used as an aid in visualizing the addition and subtraction operations for two-digit numbers. When hundred-boxes, ten-boxes and single blocks are used for illustrating addition, each addend is represented by a different color. For subtraction, all boxes and blocks are the same color. X's are used to represent taking away.

OBJECTIVES

To regroup ones to make tens and ones (3 tens and 15 ones as 4 tens and 5 ones)

PACING

Level A	All (1-2, 5-6 guided)
Level B	All (1-2, 5-6 guided)
Level C	All (1, 5-6 guided)

SUGGESTIONS

Initial Activities 1. Use bundles of sticks to illustrate the renaming of numbers. Give the child 15 loose sticks. Ask the child to write 15 ones in a place value chart. (see page 94)

Explain to the child that it is sometimes more convenient to bundle the sticks in bundles of ten and leftovers. Have the child put 10 loose sticks into a bundle (put an elastic around the bundle). Ask, "How many sticks are in the bundle? (10) How many are loose? (5) How many sticks are there altogether?" (15) Have the child write 1 ten and 5 ones in a place value chart.

Tell the child to take apart the bundle of ten sticks and put them with the 5 loose sticks. Ask, "How many sticks are there?" Elicit from the child that we started with 15 loose sticks and by grouping the sticks we had 1 bundle of ten and 5 loose (ones) sticks.

ACTIVITIES

1. To provide practice renaming for subtraction, have the child complete a tens and ones chart. Assemble several containers and label them A, B, C, and so on. Fill each with a large number of ice cream sticks or beans. The child chooses one container and groups the objects into piles of tens and ones as indicated in the chart.

	Tens	Ones		Tens	Ones	
A	2	17		3	7	
B	3	15				
C	2	15				
D	3	10				

2. Provide practice for renaming with a matching activity. Use pairs of number name cards for the same number such as:

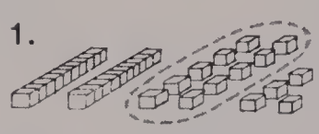
4 tens + 2 ones	3 tens + 12 ones

Shuffle the cards. Have the child match number name cards for the same number.

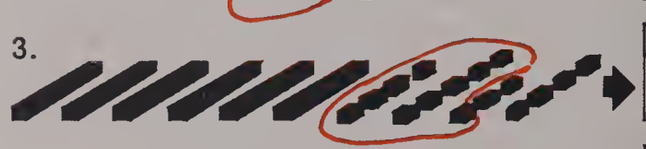
Regrouping

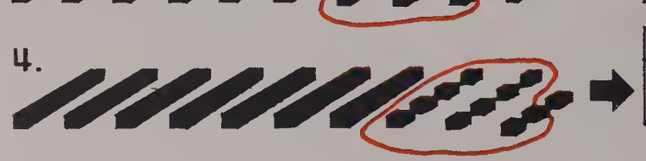
Put a ring around 10 ones.

Rename.

1. 

2.

3. 

4. 

Rename.

5. tens | ones: 3 | 12 → tens | ones: 4 | 2 → 42

6. tens | ones: 1 | 15 → tens | ones: 2 | 5 → 25

7. tens | ones: 7 | 13 → tens | ones: 8 | 3 → 83

8. tens | ones: 8 | 10 → tens | ones: 9 | 0 → 90

Using the Book Ask the child to count the number of tens boxes and ones blocks. (2) (15) Then have the child trace the ring around the group of ten blocks and explain that this group is now the same as a ten box. Ask the child to explain where the ten circled blocks from the left hand picture are in the right hand picture. (ten box) Tell the child that 3 tens and 5 ones are written 35.

Panel 1: Tell the child to trace the circle around the ten blocks. Have the child count the number of tens (3) and the number of ones (4) and find these numbers in the place value chart. Ask, "How do we write 3 tens and 4 ones?" (34) Trace the 34 in the blank space.

Panels 2-4: Ask, "Are there ten blocks that can be put together to make a ten box?" (yes) Circle ten blocks. Have the child count, fill in the place value chart and write the short form of the number.

Panel 5: Have the child look at the place value chart. Ask, "How many tens? (3) How many ones? (12) Can we make a box of ten from the 12 ones? (yes) How many tens are there now? (4) How many ones are left over?" (2) Have the child trace the 4 and 2 in the place value chart and then write the number in the blank space.

Panels 6-8: Tell the child to regroup the ones to make tens and ones and write the new number in the place value chart and the blank space.

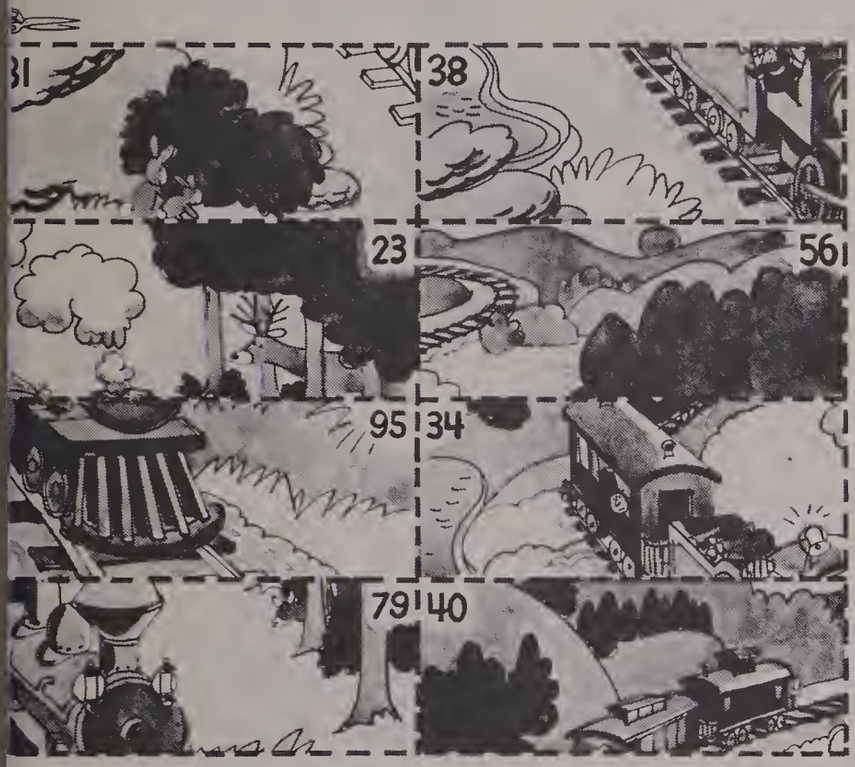
Rolling Along

. Rename.

tens	ones	
3	10	40
2	14	34
2	18	38
7	11	81

tens	ones	
4	16	56
1	13	23
6	19	79
8	15	95

. Cut out the puzzle below.



2 (two hundred twelve) Activity A renaming puzzle

sing the Book This is a cut and paste activity.

Panel 1: Tell the child to write the two-digit numeral on each rectangle i this panel.

Panel 2: Give the child a card 14 cm by 17 cm on which to arrange nd paste the parts to the puzzle. Tell the child this part of the page shows a icture puzzle that has been mixed up. The parts are to be cut out and ranged on a card in the order shown by the answers in panel 1 at the top f the page. When the pieces are arranged properly, paste them to the card. he picture when completed shows an old fashioned locomotive.

OBJECTIVE

To give different names for numbers

PACING

Level A All (guided)
Level B All (guided)
Level C All

MATERIALS

cards described in the Initial Activity

SUGGESTIONS

Initial Activity Prepare cards such as 3 tens + 12 ones, 1 ten + 15 ones, 6 tens + 10 ones, and so on. Then, prepare cards for the corresponding two-digit numerals 42, 25, 70, and so on. Have the child pair the cards so that the two cards in each pair name the same number.

ACTIVITIES

1. Have the child complete Bulletin Board suggestion 1 in the Chapter Overview.

2. Give the child a list of number names such as 1 ten + 4 ones. Have the child write the two-digit numeral for each of the numbers.

3. For each number name at the top of Panel 1, have the child show a set of ten-boxes and loose blocks to match the number frame.

4. Duplicate sentences such as 4 tens + 18 ones = ___. Have the child write the numeral in the blank to make a true sentence.

RELATED AIDS

Page 211
ACT. MASTERS—50.

Page 212
ACT. MASTERS—50.

OBJECTIVE

To add ones to tens and ones with regrouping, using the short form

PACING

Level A	213 All (1-2 guided)
	214 All (1-2 guided)
Level B	213 All (1-2 guided)
	214 All (1 guided)
Level C	213 All (1-2 guided)
	214 All

MATERIALS

9 full ten-boxes

BACKGROUND

See Item 2 in the Background of the Chapter Overview.

SUGGESTIONS

Initial Activities 1. The child might benefit from reviewing addition with regrouping using the expanded form. Guide the child in finding the sum of 46 + 7 using the procedure described in the Initial Activity on page 211, using blocks.

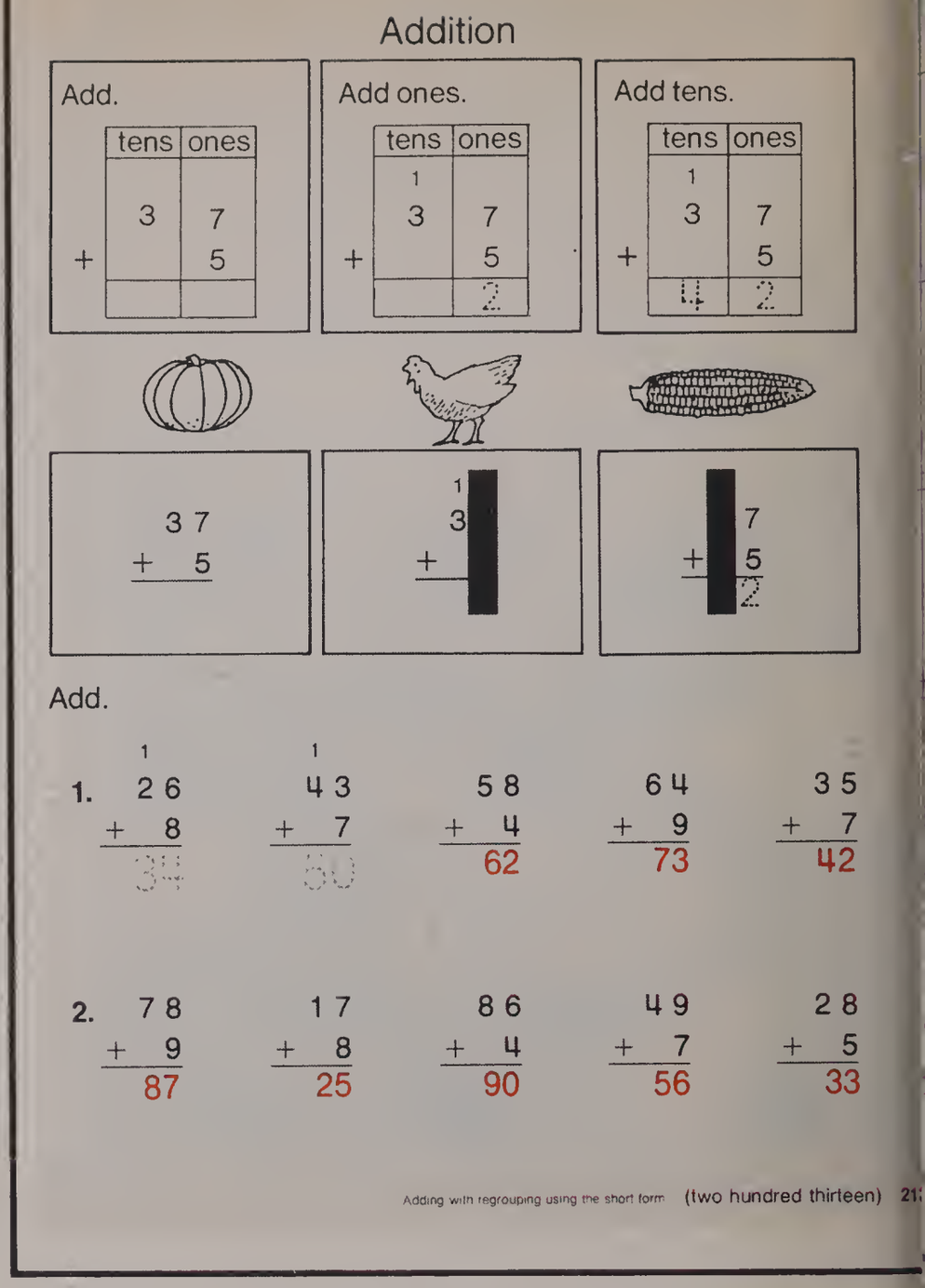
2. Discuss with the child the fact that there is a shorter way to show the addition above. Write:

Add.

tens	ones
4	6
+	7

Assist the child in finding this sum. Elicit that first we add the ones: 6 + 7 = 13. We rename 13 as 1 ten + 3 ones. We place the 3 in the ones place and the 1 ten with the other tens. (See display at top of pupil text, page 213.) Guide the child to add the tens: 1 ten + 4 tens = 5 tens.

Write the short form for this addition. Have the child find the sum using this form. Stress the idea that first we add the ones, then rename and regroup. Next we add the tens to get the sum 53.



Using the Book Ask the child to read the addition above the pumpkin. Ask, "What is the two-digit numeral for 3 tens + 7 ones? (37) Is the addition exercise below the pumpkin the same as that above except for the way the addends are named? (yes)" Ask the child to look above the chicken. Say, "Let's do the first step. Add ones." Ask, "What is the sum of 7 ones and 5 ones? (12) 12 means 1 ten + 2 ones." Ask, "Where was the 2 written? (under the ones) Where was the 1 ten written? (above the tens)" Then ask the child to look below the chicken. Ask, "What does the 3 mean? (3 tens) What does the 7 mean? (7 ones) What is the sum of 7 ones and 5 ones? (1 ten + 2 ones) Why was 2 written below the 5? (ones) Why was 1 written above the 3? (tens)" Ask the child to look above and below the ear of corn for the next step adding tens. Have the child verify the sum of the tens in both forms. Tell the child the addition below the ear of corn shows the short form.

Panels 1-2: Have the child complete each addition in short form.

d.

29	59	15	87	63	27
+ 4	+ 1	+ 7	+ 6	+ 8	+ 6
33	60	22	93	71	33
82	38	65	58	63	39
+ 9	+ 3	+ 8	+ 7	+ 7	+ 8
91	41	73	65	70	47
58	36	26		17	21
+ 6	+ 4	+ 9		+ 7	+ 9
64	40	35		24	30
76	27	87		75	68
+ 6	+ 9	+ 3		+ 5	+ 9
82	36	90		80	77
77	49	19	84	37	53
+ 5	+ 2	+ 3	+ 7	+ 4	+ 9
82	51	22	91	41	62
37	78	15	38	34	89
+ 8	+ 8	+ 9	+ 2	+ 9	+ 6
45	86	24	40	43	95

Using the Book Panel 1: The child may state the first exercise as 29 plus 4. Ask, "What is the sum of 9 ones and 4 ones? (13) 13 means 1 ten + 3 ones." Ask, "Where is the 3 written? (under the ones) Where is the 1 ten written? (above the tens) One ten plus 2 tens is how many tens? (3) Write the 3 below the 2. What is the sum? (33)" Have the child complete the remaining exercises in the panel.

Panels 2-6: Tell the child to add.

ACTIVITIES

1. Provide practice on basic addition and subtraction with sums 10-18. Use the Basic Fact Wheels described in the Activity Reservoir.

2. Write these exercises:

26	26	26
+ 1	+ 2	+ 3
(27)	(28)	(29)
26	26	26
+ 4	+ 5	+ 6
(30)	(31)	(32)

Ask the child to find each sum and look for a pattern. You might ask, "When is the sum less than 30? When is the sum equal to 30? When is the sum greater than 30?" (Answers in parentheses.)

3. Challenge the child with these exercises.

37 + 1 ○ 40 (<)
37 + 2 ○ 40 (<)
37 + 3 ○ 40 (=)
37 + 4 ○ 40 (>)
37 + 5 ○ 40 (>)

Tell the child to write >, <, or = in each ring to make a true sentence. Answers are in parentheses. Have the child relate each sentence to the sum of ones. That is, the sum is less than 40 when the sum of the ones is less than 10.

EXTRA PRACTICE

Practice Exercises p. 255 (top)

Tell the child to add.

1.	35	77	53	21	48
	+7	+9	+9	+9	+7
	42	86	62	30	55
2.	65	84	79	38	59
	+9	+8	+2	+4	+3
	74	92	81	42	62
3.	28	17	66	47	58
	+6	+6	+7	+3	+3
	34	23	73	50	61

RELATED AIDS

ACT. MASTERS—51.

OBJECTIVE

To add tens and ones with regrouping, using the short form

PACING

Level A 215 All (1-2 guided)
216 All (1-2 guided)
Level B 215 All (1-2 guided)
216 All (1 guided)
Level C 215 All (1-2 guided)
216 All

MATERIALS

9 full ten-boxes

BACKGROUND

See Item 2 in the Background of the Chapter Overview.

SUGGESTIONS

Initial Activities 1. The child might profit from a review of adding tens and ones with regrouping using the expanded form. Assist the child in finding the sum of 45 + 28 as described in the Initial Activity on page 211.

2. Explain that there is a shorter way to show addition. Write:

Add

tens	ones
4	5
+ 2	8

45
+28

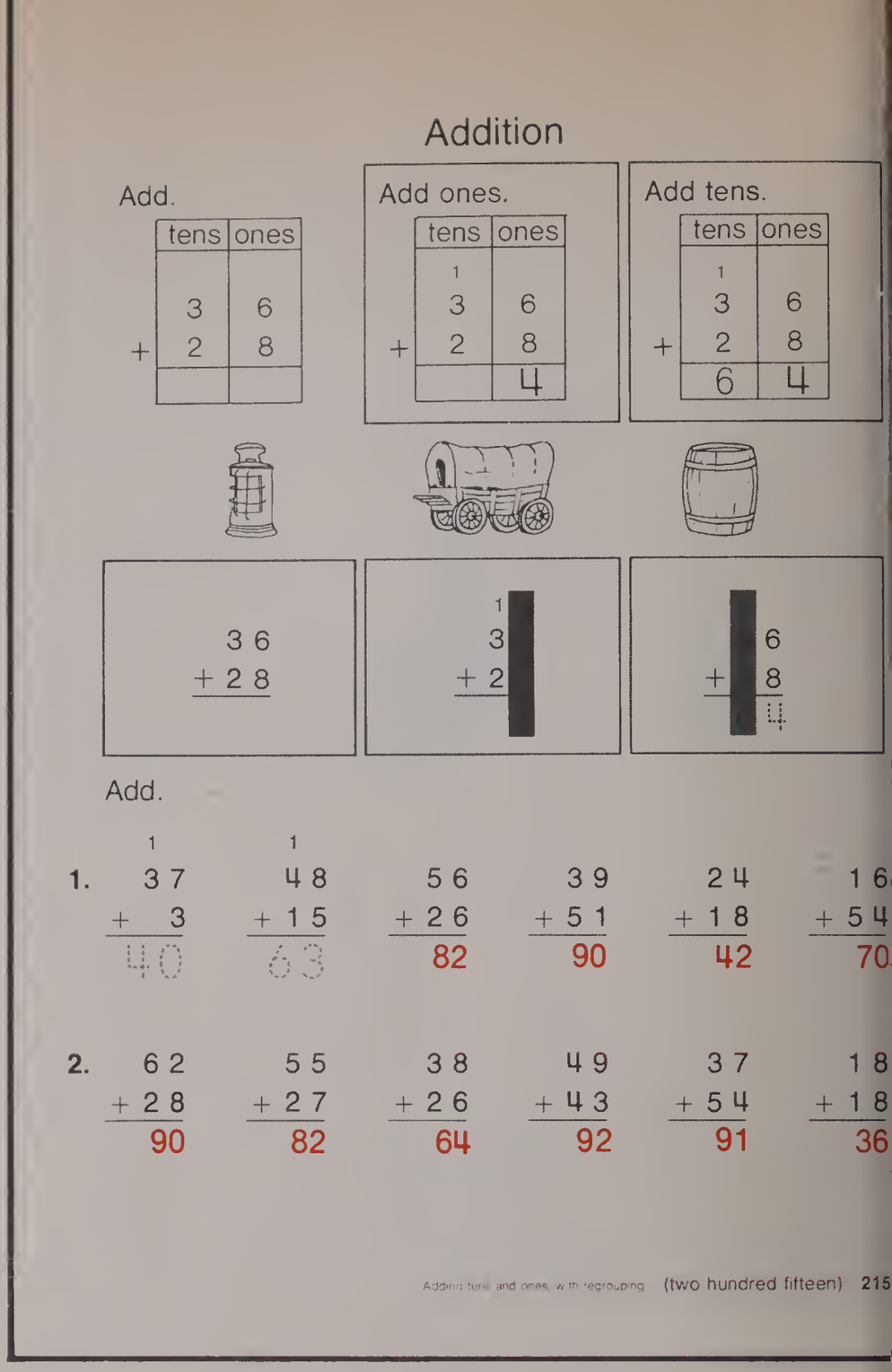
Develop each step in both forms simultaneousiy. Have the child record in the short form as you develop the expanded form.

First step: Add ones. 5 + 8 = 13. We rename 13 as 1 ten + 3 ones. Place the 3 in the ones place and the 1 ten with the other tens.

tens	ones
1	
4	5
+ 2	8
	3

1
4 5
2 8
3

Second step: Add tens in the expanded form. 1 ten + 4 tens + 2 tens = 7 tens. Then add tens in the short form.



Using the Book Encourage the child to compare the addition exercises above and below the lantern. Elicit the idea that they are the same except for notations. Tell the child that the first step in adding is shown above the wagon for the long form and below the wagon for the short form. Have the child explain the first step in the long form. (Add ones, rename 14 as 1 ten plus 4 ones, and regroup writing 4 in ones place and 1 ten above 3 tens.) Then have the child explain the corresponding step in the short form below the wagon. Have the child verify the sum of the tens in the addition above and below the barrel. You may write the addition exercises below the lantern on the chalkboard and have the child tell each step in adding.

Panels 1-2: Tell the child to add.

dd.

46 49 95	37 +54 91	18 +18 36	24 +36 60	47 +28 75
19 37 56	45 +45 90		63 +17 80	29 +58 87
75 18 93	43 +27 70	38 +42 80	24 +38 62	59 +17 76
35 46 81	65 +17 82	44 +26 70	45 +36 81	29 +49 78
16 56 72	47 +47 94	35 +35 70	58 +29 87	64 +29 93

Using the Book Panel 1: The child may state the first exercise as 46 plus 49. Then have the child explain the first step in the short form. (Add ones, rename 15 as 1 ten plus 5 ones, and regroup writing 5 in the ones place and 1 ten above 4 tens.) Then have the child explain the next step (add tens, 1 ten plus 4 tens plus 4 tens) and give the sum, 95. Tell the child to complete the remaining exercises in the panel.

Panels 2-5: Tell the child to add.

ACTIVITIES

1. The child may need practice in simply analyzing a problem to decide if regrouping is necessary before adding. On separate file cards, write examples like these:

48 + 1	58 + 3	27 +14	63 +15

2. The child may benefit by analyzing problems such as:

Have the child sort the cards into two piles. ("I need to regroup" and "I do not need to regroup.")

46 +22	46 +23	46 +24	46 +25	46 +26

Ask the child to just look at the additions and tell, without adding, which ones involve regrouping. Tell the child to notice that the sum of the tens is less than 70. Ask, "When is the sum of the two numbers less than 70? Equal to 70? Greater than 70?" (Hint: Tell the child to consider the sum of the ones.)

3. For practice on regrouping, duplicate exercises like these:

3 tens + 18 ones
4 tens + ___ ones

4. Complete Bulletin Board suggestion 2 in the Chapter Overview.

5. Write similar sentences:

20 + 50 = 70
24 + 53 ○ 80
24 + 54 ○ 80
24 + 55 ○ 80
24 + 56 ○ 80
24 + 57 ○ 80
24 + 58 ○ 80

Tell the child to write >, <, or = in each ring to make a true sentence. Have the child study the pattern in the sum of the ones and decide when regrouping is required (when the sum of the ones is 10 or greater).

RELATED AIDS

BFA COMP LAB I—33, 34.
BFA PROB. SOLVING I—97.

OBJECTIVE

To review and maintain the following skills:

To identify circles [186]
To draw a triangle [183]
To draw a rectangle [184]
To find lengths [197, 198]

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

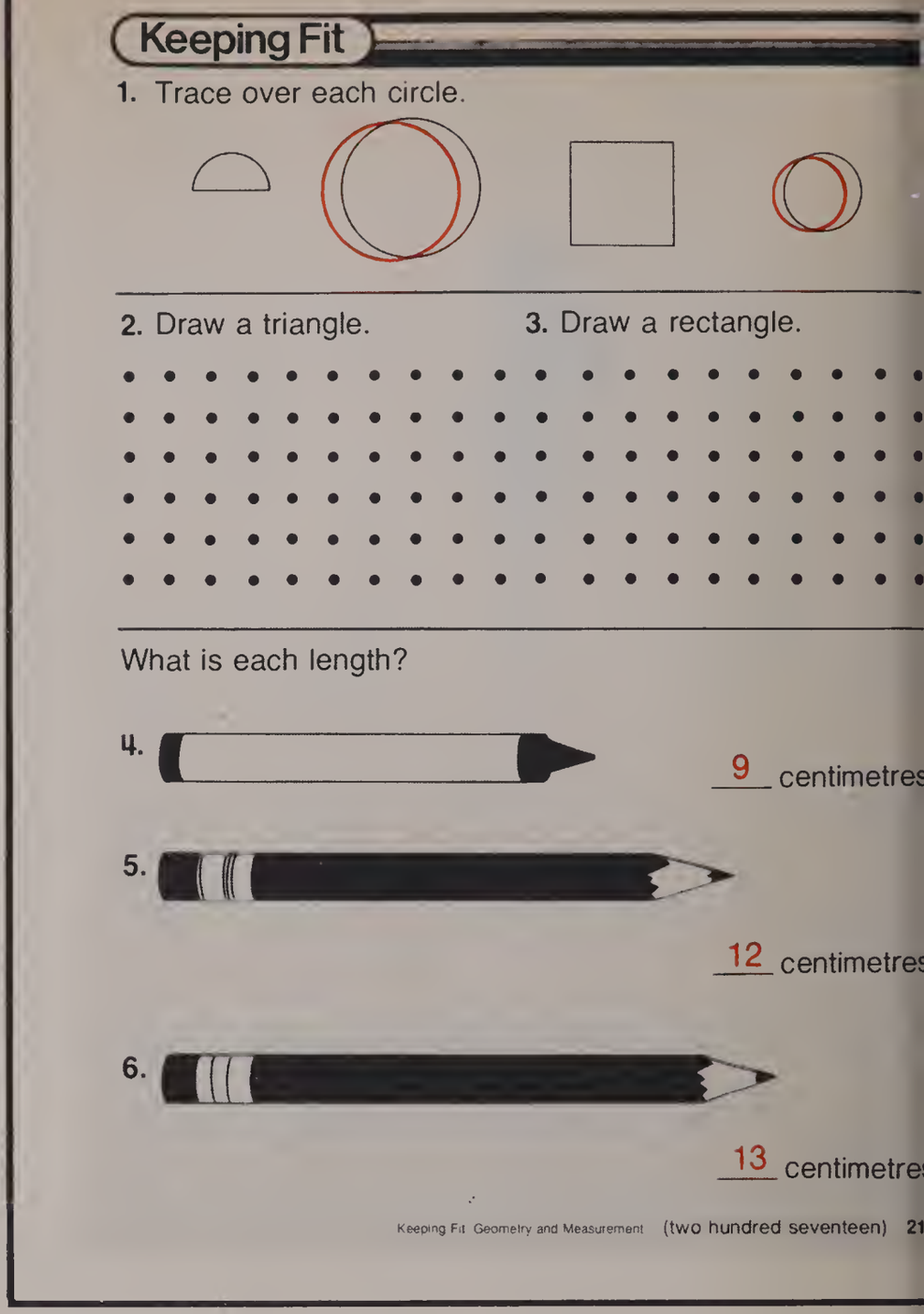
Initial Activity If children have unusual difficulty with the problems on this page, you could provide the necessary remedial work. The page references following the objectives are keyed to the lessons in which the concepts are taught.

ACTIVITIES

1. Provide ice cream sticks. Let the child explore and make shapes for squares, triangles, and rectangles.

.2. Provide string and coloured construction paper. Have groups of children cut out various sized shapes (circles, squares, rectangles) to make a mobile—a hanging construction.

3. Provide an opportunity for the child to explore body measurements. Provide the children with yarn to measure their height, arms, legs, neck, nose, etc. Children might compare their measurements with things in the room or with other classmates'. (You might find it necessary to caution children to avoid pejorative comments, for example, "Harry has fat legs.")



Using the Book Panel 1: Tell the child to trace over each circle.

Panels 2-3: Tell the child to use the dots and draw a picture of a triangle and a rectangle.

Panels 4-6: Have the child find each length to the nearest centimetre.

Subtraction

ubtract.

14	28			56	18
- 2	- 14			- 21	- 6
12	14			35	12
42	70			74	86
- 31	- 20			- 23	- 32
11	50			51	54
69	77			38	55
- 26	- 5			- 3	- 22
43	72			35	33
30	56			37	19
- 10	- 4			- 13	- 5
20	52			24	14
77	90			39	88
- 41	- 60			- 4	- 21
36	30			35	67
75	98	41	89	60	78
- 33	- 12	- 31	- 23	- 30	- 30
42	86	10	66	30	48
67	49	45	40	27	68
- 6	- 8	- 31	- 10	- 4	- 5
61	41	14	30	23	63
59	50	28	83	72	39
- 12	- 40	- 7	- 52	- 50	- 7
47	10	21	31	22	32

Using the Book Panels 1-8: Tell the child to subtract.

OBJECTIVE

To subtract tens and ones, no regrouping

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

Initial Activity Write exercises similar to those on page 218 to review subtracting ones from tens and ones and subtracting tens and ones. Remind the child that ones are always subtracted first.

ACTIVITIES

1. Write subtraction problems similar to those on page 218 on index cards. Write the answer on separate cards. Have the child match each problem with its correct answer.

2. Have the child play Basketball. (See Flash Card Sports described in the Activity Reservoir.) Give one point for exercises subtracting ones from tens and ones. Give 2 points for exercises with 2-digit subtractions.

3. Write mini-problems on index cards using 1 and 2 digit subtractions. Challenge the child to write the subtraction for each and give the difference.

4. You may wish to reverse the above activity. Give the child subtraction exercises and then challenge the child to write a mini-problem for each.

EXTRA PRACTICE

Tell the child to subtract.

1.	78	35	47	80	59
	-21	-12	-17	-70	-28
	57	23	30	10	31
2.	88	97	58	38	67
	-13	-70	-32	-20	-62
	75	27	26	18	5
3.	49	53	77	83	90
	-31	-32	-41	-23	-40
	18	21	36	60	50

RELATED AIDS

BFA PROB. SOLVING I—74-77.

OBJECTIVE

To subtract ones from tens and ones with regrouping, using the expanded form

PACING

Level A All (1-3 guided)
Level B All (1-3 guided)
Level C All (1-2 guided)

MATERIALS

9 full ten-boxes, 9 blocks

SUGGESTIONS

Initial Activity Show a set with 5 ten-boxes of blocks and 3 blocks. Ask the child to tell the number of blocks. Tell the child you want to take 7 blocks from the set. Ask, "Are there 7 loose blocks in the set? (no)" Discuss the idea of taking a ten-box of blocks and changing it to loose blocks. Ask, "How many loose blocks did we have? (3) Let's use a ten-box to get more loose blocks. How many loose blocks are there now? (13) Now, can we take 7 blocks? (yes) How many loose blocks are left? (6)" Tell the child, "We will subtract to find how many blocks are left." Write 53 − 7, short form. Ask the child to give the expanded numeral for 53. Write:

53
−7

tens	ones
5	3
	7

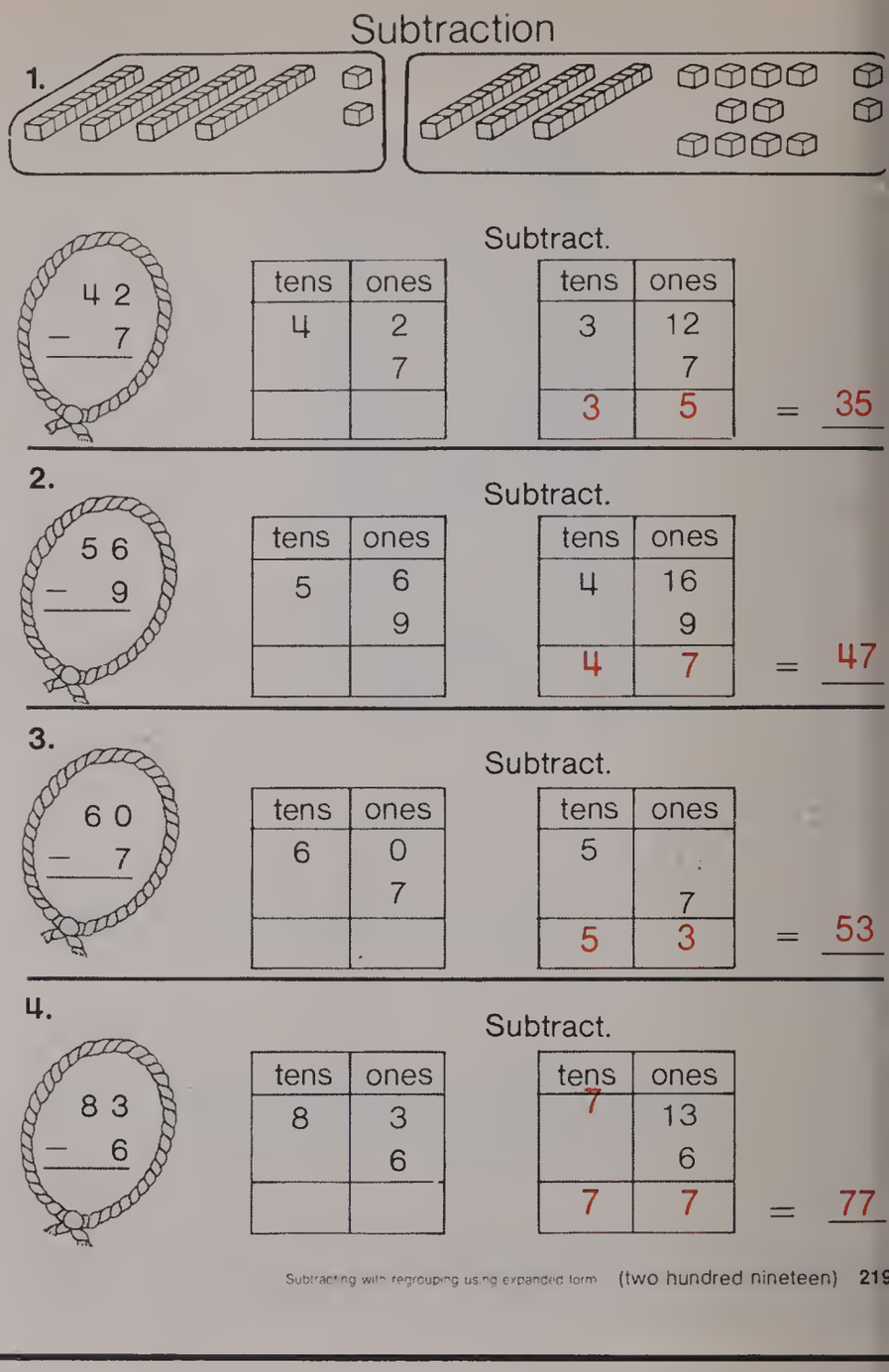
Relate the next step to changing a ten-box of blocks to loose blocks.

Write: Subtract.

tens	ones
4	13
−	7

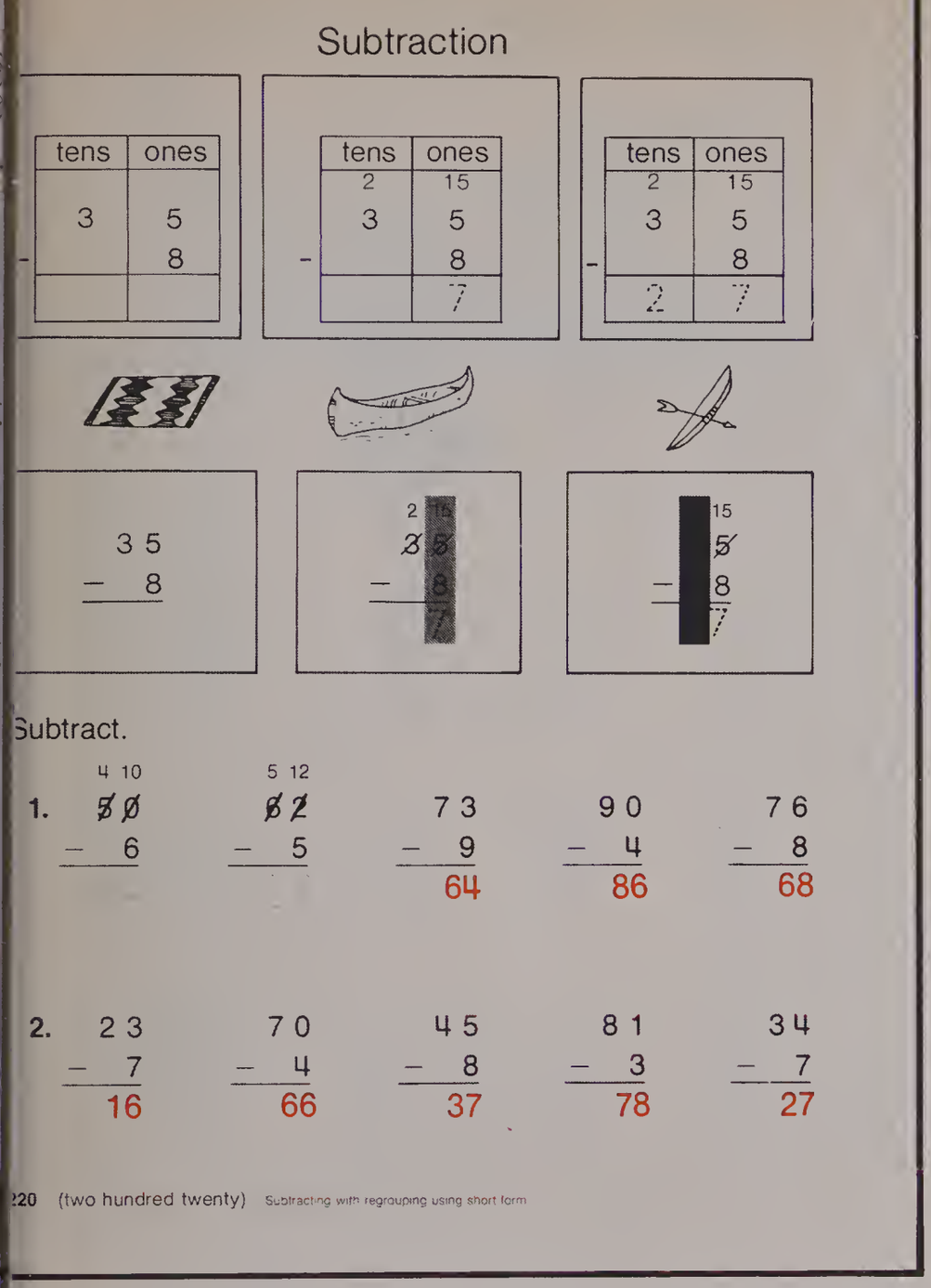
Have the child give the difference and the two-digit numeral.

1. Involve all children in the matching activity on page 211.



Using the Book Panel 1: Have the child trace the ring around the 42 blocks on the left. Tell the child to think about taking 7 blocks away from the set. Ask, "How many loose blocks are in the ring? (2) Can you take 7 blocks away from 2 blocks? (no)" Tell the child we may take a ten-box and change it to loose blocks as shown in the ring on the right. Ask, "How many ten-boxes are there now? (3) How many loose blocks? (12) Can you take 7 blocks from 12 blocks? (yes)" Have the child read the subtraction in the first rope ring. Ask, "Does the second rope ring show the same subtraction even though the number name is different? (yes) Can you subtract 7 ones from 2 ones? (no)" Explain, "We may rename 4 tens + 2 ones as 3 tens + 12 ones. Now, can you subtract 7 ones from 12 ones? (yes)" Then have the child complete the subtraction and write the two-digit numeral.

Panels 2-4: Tell the child to complete each subtraction. In panels 3 and 4, the child is also required to complete the first number name.



Using the Book Ask the child to verify that the subtraction exercises above and below the blanket are the same except for notation. Have the child read each subtraction exercise. Ask, "Can you subtract 8 ones from 5 ones? (no) What may we do to get more ones?" Guide the child in describing the method of taking 1 ten to make more ones. Call attention to the subtraction exercises above and below the canoe. Have the child tell how tens were changed to ones in both of these exercises. Tell the child to subtract 8 ones from 15 ones. "What is the difference? (7) Do you see 7 in the ones place? (yes)" Call attention to the subtraction exercise on the right. Explain, "Now that we have subtracted ones, we subtract tens." Ask, "Are there any tens to subtract from 2 tens? (no) Is 2 tens + 7 the answer above the bow and arrow? (yes) Is it the same as the answer below the bow and arrow? (yes)"

Panels 1-2: Tell the child to subtract. Explain that in each exercise, the child must show the change in tens and then the change in ones before subtracting.

OBJECTIVE

To subtract ones from tens and ones with regrouping, using the short form

PACING

Level A	220 All (guided) 221 All (1 guided)
Level B	220 All (guided) 221 All
Level C	220 All (guided) 221 All

MATERIALS

9 full ten-boxes, 9 blocks

BACKGROUND

See Item 2 in the Chapter Overview Background.

SUGGESTIONS

Initial Activities 1. Review subtracting ones from tens and ones with regrouping as on page 219. Use 42 - 5. Show a set with 4 ten-boxes of blocks and 2 blocks. Relate the expanded form to taking 5 blocks from the set.

2. Point out that there is a shorter way to show the subtraction 42 - 5. Discuss the idea of combining steps in this manner:

Subtract.

tens	ones
3 4	12 2 5

Guide the child in completing this subtraction. Elicit these ideas: First we subtract the ones. We cannot subtract 5 from 2, so we must rename and regroup 4 tens + 2 ones. Assist in renaming the tens and regrouping the ones to get 3 tens + 12 ones. (Now we have enough ones to subtract.) Have the child subtract 5 from 12 to get 7. Then bring down the 3 to complete the subtraction.

OBJECTIVE

To subtract ones from tens and ones with regrouping, using the short form

PACING

Level A All
Level B All
Level C All

BACKGROUND

See Item 2 in the Chapter Overview Background.

SUGGESTIONS

Initial Activity Introduce the short form for subtraction. Write:

Subtract.

6 tens + 3	63
− 9	− 9
___tens + ___ = ___	

Assist the child in completing each subtraction form, working the long form first. Include the auxiliary marks as in the display on page 220.

ACTIVITIES

1. Sometimes selecting the appropriate way to rename a number (when given a choice) helps to clarify renaming in subtraction. Prepare a worksheet with examples like the following:

97	9 tens + 17 ones
− 8	9 tens + 7 ones
	8 tens + 17 ones

Tell the child to ring the numeral you should be thinking about as a name for 97 when subtracting 8 from 97.

2. Continue giving the child practice on subtracting from sums 10-18. Play Bingo as described in the Activity Reservoir. Fill cells with subtraction only.

3. Prepare a worksheet. The child writes + or − in each ring to make true sentences. (Answers are included in parentheses.)

8 ○ 6 ○ 3 = 11 (+, −)
5 ○ 2 ○ 9 = 12 (−, +)
7 ○ 5 ○ 8 = 4 (+, −)
9 ○ 3 ○ 7 = 13 (−, +)

Limit exercises to basic facts. Estimating an answer may benefit a child in computations. Give the child sequences of subtractions such as:

76	76	76	76	76
− 4	− 5	− 6	− 7	− 8

Subtraction

Subtract.

1.

66	73	17	54	47
− 9	− 4	− 8	− 6	− 8
57	69	9	48	39

2.

75	45		63	83
− 7	− 6		− 7	− 8
68	39		56	75

3.

34	40	35	73	25
− 6	− 7	− 8	− 6	− 7
28	33	27	67	18

4.

43	94	86	20	77
− 5	− 8	− 9	− 3	− 8
38	86	77	17	69

5.

62	71	60	93	80
− 4	− 7	− 6	− 8	− 5
58	64	54	85	75

Practice (two hundred twenty-one) 221

Using the Book Panel 1: Guide the child in completing the first exercise, 66 minus 9. Then have the child complete the exercises in the panel by showing the change in tens and ones before subtracting.

Panels 2-5: Tell the child to subtract.

EXTRA PRACTICE

Practice Exercises p. 255 (bottom)

RELATED AIDS

ACT. MASTERS—52.

firefighters

fire truck

fire hat

1. 3 fire trucks.
   12 firefighters.
   How many more firefighters?

$$\begin{array}{r} 12 \\ -\ 3 \\ \hline 9 \end{array}$$

2. 23 fire alarms in the day.
   16 fire alarms at night.
   How many fire alarms in all?

$$\begin{array}{r} 23 \\ +\ 16 \\ \hline 39 \end{array}$$

3. 7 fire hats on the truck.
   25 fire hats on the wall.
   How many fire hats in all?

$$\begin{array}{r} 25 \\ +\ 7 \\ \hline 32 \end{array}$$

4. 46 calls on Wednesday.
   7 calls on Thursday.
   How many more calls on Wednesday?

$$\begin{array}{r} 46 \\ -\ 7 \\ \hline 39 \end{array}$$

Using the Book Ask the child to describe the picture at the top of the page. You may tell the child something about the training, duties, and responsibilities of firefighters. (See Career Awareness in the Chapter Overview.)

Have the child describe and name each picture in the picture dictionary in the left column before working on any of the problems.

Panels 1-4: Assist the child, if necessary, in reading all the problems. Then have the child solve the problems. Use your judgment about the number of problems with which you should assist the child. You may ask, for example, about problem 1, "How many fire trucks are there? How many firefighters? To find how many more firefighters, do you add or subtract? (subtract)" Have the child show the computation at the right of each problem.

OBJECTIVE

To solve mini-problems

PACING

Level A	All (1-2 guided)
Level B	All (1 guided)
Level C	All (1 guided)

MATERIALS

mini-problems on file cards

SUGGESTIONS

Initial Activity For this career page, have the child give his or her experiences, if any, of seeing firefighters, fire trucks, and fire hydrants or alarms. Elicit from the child the importance of firefighters. Have the child tell how these people work with and help other people. See the Chapter Overview for more information.

Prepare problems similar to those on page 222. Have the child read them and decide whether to add or subtract. Then have the child write and solve the problem and answer the question.

ACTIVITIES

1. You might want to have a firefighter visit and talk with the children in the class.

2. If the opportunity arises, have the child take a tour of the fire house in the community.

3. Have the child make a list of "safety tips" in case of a fire at home or school.

RELATED AIDS

ACT. MASTERS—53, 54.

OBJECTIVE

To subtract tens and ones with regrouping, using the short form

PACING

Level A	223 All (guided)
	224 All (1 guided)
Level B	223 All (guided)
	224 All
Level C	223 All (guided)
	224 All

MATERIALS

9 full ten-boxes, 9 blocks

BACKGROUND

See Item 2 in the Chapter Overview Background.

SUGGESTIONS

Initial Activities 1. Show 8 ten-boxes of blocks and 4 blocks. Discuss the idea of taking 39 blocks from the set. Relate the blocks to the expanded form. Have the child complete the subtraction and give the two-digit numeral for the difference.

2. Tell the child there is a shorter way to show the subtraction, 84 - 39. Discuss the idea of combining the steps in this manner:

Subtract.

tens	ones
7	14
~~8~~ 3	~~4~~ 9

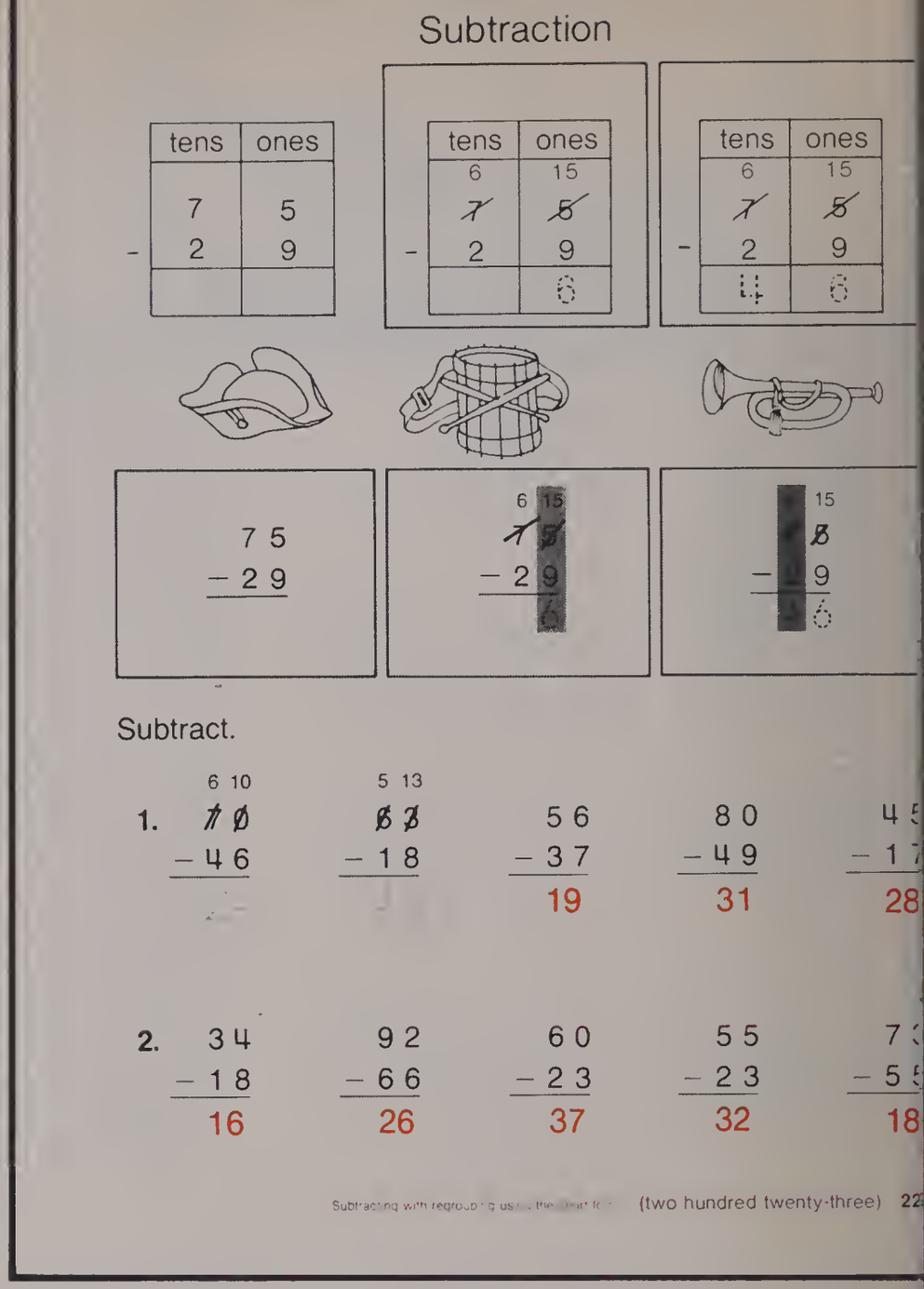
Guide the child to complete the subtraction.

3. Introduce the short form for subtracting tens and ones with regrouping. Write:

Subtract.

tens	ones
8	4
3	9

84
-39



Using the Book Have the child read the subtraction exercises above and below the hat. Ask, "Can you subtract 9 ones from 5 ones? (no) May we use a ten to make more ones? (yes)" Call attention to the subtraction exercises above and below the drum. Explain, "One ten was used to make more ones. How many tens are left? (6) How do the exercises show that only 6 tens are left? (The 7 tens is marked out and 6 tens written above.) Now how many ones are there? (15) How did we get 15 ones? (1 ten + 5 ones = 15) Subtract the ones. 15 - 9 is equal to what number? (6) Trace the 6 in both exercises above and below the drum." Now explain that the next step is shown above and below the horn. "Subtract the tens. 6 tens - 2 tens is equal to what number? (4 tens)" Have the child trace the 4 in each exercise and tell the difference, 46. Tell the child the short form is shown below the horn.

Panels 1-2: Tell the child to subtract.

Subtract.

32	83	71	56	60
− 14	− 27	− 26	− 38	− 19
18	56	45	18	41
90	72		84	92
− 43	− 58		− 46	− 37
47	14		38	55
56	40	75	64	38
− 39	− 17	− 48	− 35	− 19
17	23	27	29	19
94	54	80	72	91
− 65	− 37	− 56	− 54	− 54
29	17	24	18	37
82	62	50	87	71
− 63	− 35	− 18	− 18	− 45
19	27	32	69	26

Using the Book Panel 1: You may want to assist the child in completing the first exercise, 32 - 14. Then have the child complete the remaining exercises in the panel.

Panels 2-5: Tell the child to subtract.

Have the child subtract using the long form. Use the auxiliary marks as in the preceding activity. This time, each time the child shows a step in the long form, have the child show the corresponding step in the short form. The child should show the auxiliary marks in the short form also.

ACTIVITIES

1. Give the child practice in analyzing whether or not to regroup in subtraction. On file cards, write examples like these:

72	48	87	54	60
- 8	-16	-29	-32	-47

The child sorts the cards into an "I need to regroup first" pile and an "I don't need to regroup" pile.

2. Play a game of Stump the Experts. Duplicate a worksheet of items like those shown below. The child rings those that are incorrect. You may wish to have the child use a three-minute egg timer. (Correct answers are in parentheses.)

35	60	44
−17	−28	−39
(18)	42	25
40	92	71
−23	−65	−25
(17)	37	(46)

3. Challenge the child to add three addends with regrouping from ones to tens:

36	17	58
22	46	12
+18	+34	+25

RELATED AIDS

ACT. MASTERS—54.
BFA COMP LAB I—56, 57, 61, 62.
BFA PROB. SOLVING I—98-102.

OBJECTIVE

To subtract with regrouping, and check using addition

PACING

Level A (Initial Activities only)
Level B All (1-3 guided)
Level C All (1-2 guided)

SUGGESTIONS

Initial Activities 1. Write these sentences:

$8 - 5 = 3$ so $3 + 5 =$ ___
$15 - 8 = 7$ so $7 + 8 =$ ___
$17 - 9 = 8$ so $8 + 9 =$ ___

Ask the child to read each sentence and give the sum. Discuss the idea that when you subtract, the difference plus the number subtracted is equal to the other number. Stress the idea that this knowledge can be used to check subtraction of "big" numbers, too.

2. Write:

47	32
-15	+15
32	47

Elicit the ideas that (1) 32 in the addition is the difference in the subtraction, (2) 15 in the addition is the number subtracted in the subtraction, (3) the sum, 47, in the addition is the first number in the subtraction.

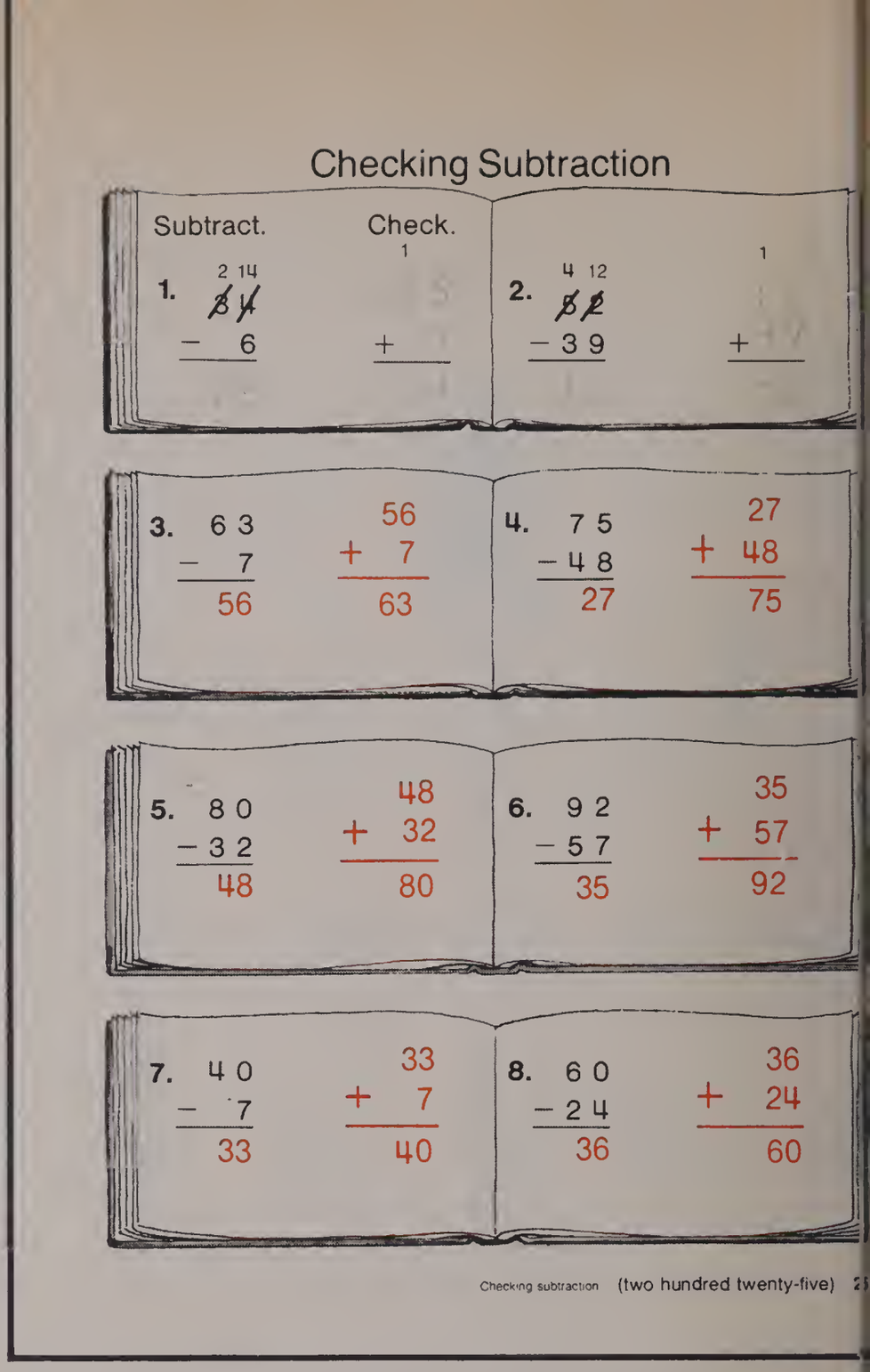
ACTIVITIES

1. See the Activity Reservoir for each game below.

2. Use the Basic Fact Practice Cards for sums 10-18.

3. Use the Basic Fact Wheels for sums 10-18.

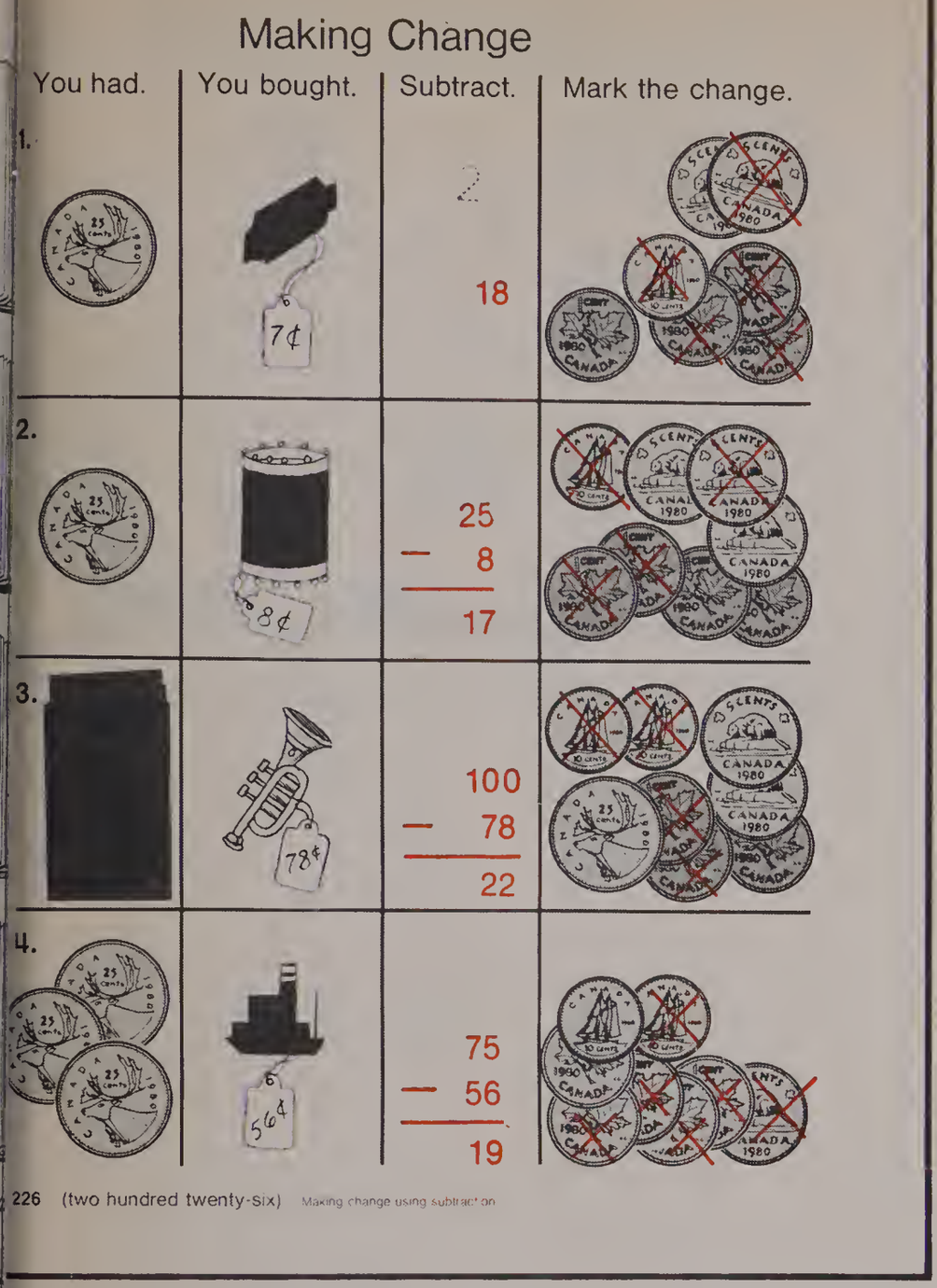
4. Play Concentration. Include money, renaming, addition and subtraction, and two-digit numbers.



Using the Book Panel 1: Guide the child in describing the steps in finding the difference. Tell the child, "The answer may be checked by adding the answer and 6. The sum should be 34 if there are no errors." Have the child trace the numerals and verify that the sum in the check is 34.

Panel 2: Have the child tell the steps in finding the difference, 13. Then have the child trace the 13. Ask the child, "The answer may be checked by adding 13 and what number? (39)" Have the child trace the addition and explain the steps. Say, "The sum is 52. Is 52 the first number in the subtraction? (yes)"

Panels 3-8: Tell the child to subtract and then write an addition on the right to check the answer.



Using the Book Panel 1: Have the child identify the coin and tell how many cents it is worth. Then have the child identify the article in the next column and tell how much it costs. Tell the child, "Suppose you had a quarter and you bought a candy bar that costs 7¢. How many cents would you have left? (18)" Have the child trace the subtraction in the third column and write the answer. Then in the last column have the child identify a set of coins that may be received as change. You may have the child mark X's on coins that show the change, 18¢.

Panels 2-4: Explain, "In each row, pretend that you had the coins or bill in the first column. Then you bought the article in the second column. Then in the third column, you subtracted to find how many cents you had left. In the last column you show a set of coins you may receive as change. The change may be shown by marking X's on coins included in the change.

OBJECTIVE

To make change using subtraction

PACING

Level A	(1-2 guided)
Level B	All (1-2 guided)
Level C	All

VOCABULARY

change

MATERIALS

pennies, nickels, dimes, quarters, articles with price tags less than 40¢

SUGGESTIONS

Initial Activities 1. Have the child identify a penny, a nickel, a dime and a quarter, and tell how much each is worth. Use play money.

2. Show various combinations (each worth less than one dollar) of pennies, nickels, dimes and quarters. Tell the child to find how many cents each is worth.

3. Give the child a quarter and show an article (with a price tag) that costs less than 25¢. Have the child use subtraction to find how many cents are left from the quarter after buying the article. Then have the child show the change.

Discuss the consumer aspects of this page—adding and subtracting with money and making change. Elicit from the child the importance of counting money and change.

ACTIVITIES

1. Ask the child to find how many cents each set is worth in each of Panels 1 through 4, page 226.

2. Ask the child to identify the set of coins in the right column that is worth the most. Then have the child identify the set of coins that is worth the least and find how many more cents the first set is than the second set.

RELATED AIDS

BFA PROB. SOLVING I—173, 176-179, 182.

OBJECTIVE

To diagnose skill in adding and subtracting through sum 18 and two-digit numbers, with regrouping

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

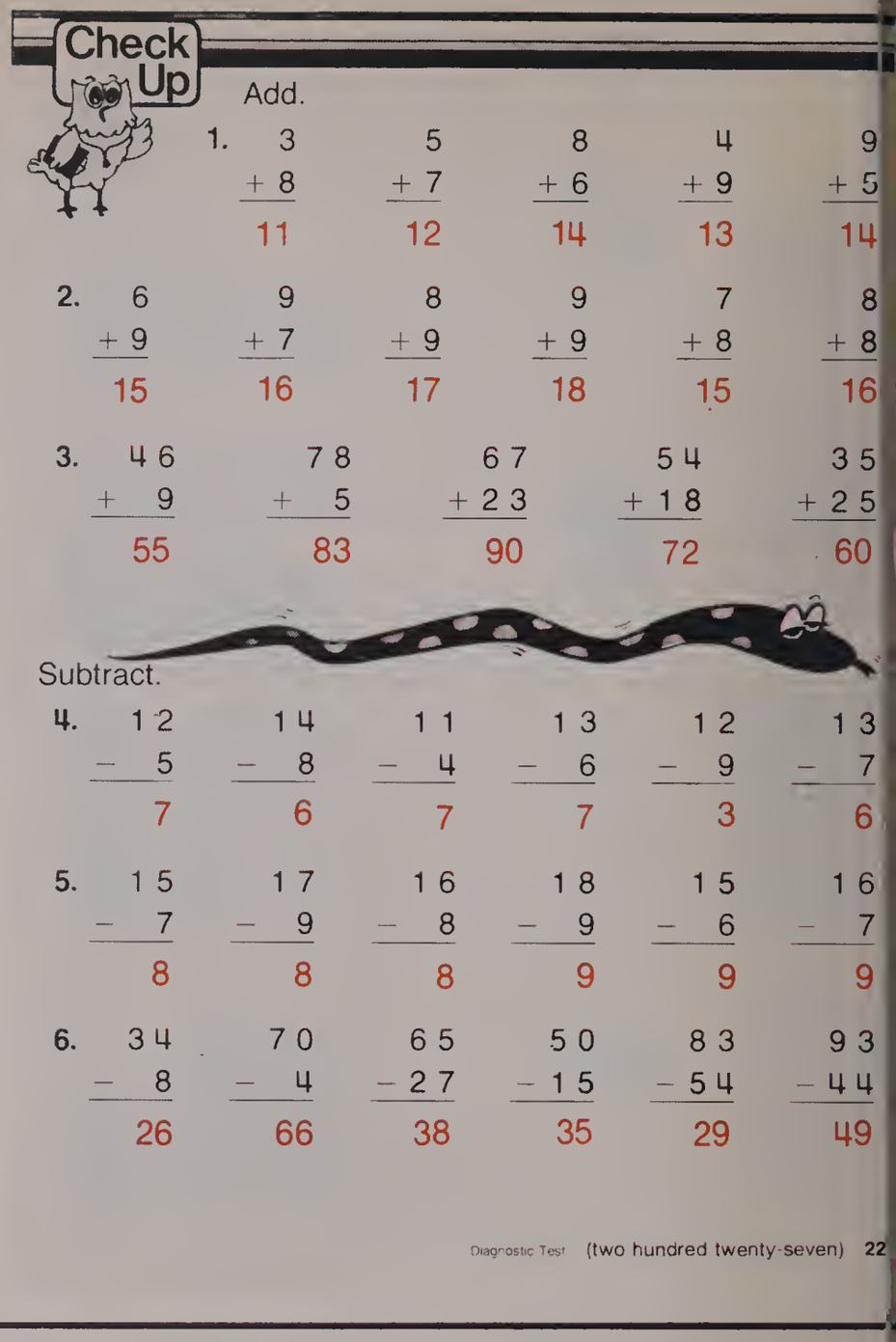
This page can be used to diagnose difficulties the child might have with adding and subtracting sums through 10 and two-digit numbers, no regrouping. The entire page need not be assigned in a single day. If preferred, you may test addition on one day and subtraction on another. On the basis of performance, you may want to provide individual help or additional remedial work for those children who have difficulty with a particular skill. Some are suggested below. The chart shows the page numbers to which the concepts apply.

Panel	Skill	Page
1	Sums 11-14	137-140
2	Sums 15-18	168, 169
3	Adding, with regrouping	211-216
4	Subtracting from 11-14	142-144
5	Subtracting from 15-18	174-176
6	Subtracting, with regrouping	219-225

ACTIVITIES

1. Provide beans, buttons, etc., and practice cards for sums through 18. Have the child use the objects to find sums and differences.

2. Play the game Concentration described in the Activity Reservoir. Include addition and subtraction with renaming, money, and fractions.



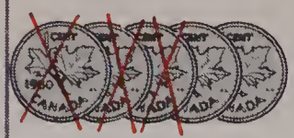
Using the Book This is a diagnostic page. (See teaching Suggestions.) Encourage the child to write each sum and difference without counting.

Panels 1-3: Tell the child to add.

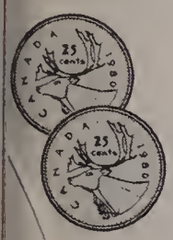
Panels 4-6: Tell the child to subtract.

1. You had | You bought | Subtract. | Mark the change.

25
− 17
8



2. You have | You buy | How much change?



50 ¢ | 34 ¢ | 16 ¢

3. Add.

37	86	48	37	56
+ 8	+ 5	+ 48	+ 25	+ 14
45	91	96	62	70

4. Subtract.

40	75	90	82	53
− 8	− 9	− 64	− 46	− 27
32	66	26	36	26

Using the Book This is a diagnostic test. The page references are given for reteaching as needed. The letter indicates the objective.

Panel 1: Tell the child, "Suppose you had the coin and you bought the toy hat. In the third column show the subtraction to find how many cents you had left. Then in the last column, mark an X on each of the coins needed to show the change." [page 226 E]

Panel 2: Have the child tell how many cents the coin is worth. Then have the child tell how many cents the bonnet costs. Ask the child to write the numeral below to show the amount of the change. [page 226 E]

Panel 3: Tell the child to add. [pages 213 A, 215 B]

Panel 4: Tell the child to subtract. The child may check by adding. [pages 219 C, 223 D]

OBJECTIVE

To evaluate achievement of the Chapter Objectives

PACING

Level A All (Omit 2)
Level B All (Omit 2)
Level C All

SUGGESTIONS

The Chapter Test is designed to be used in a diagnostic manner. It assesses the child's knowledge of the main concepts and skills that were taught in this chapter. Some children should take this test independently with guidance for instructions only. Use judgment as to whether certain children should be guided through some or all of the exercises. Check each child's work and mark the items that are incorrect. Reteaching or extra practice might be necessary to help the child acquire the concept or skill that was missed. With this reteaching, you will be able to ascertain whether the child has then learned the topic in question. See Using the Book for page references indicating where the concept or skill was taught.

ACTIVITIES

1. Have two children play computer. One child, the input, shows one coin. Another child, the output, tells the worth of it.

2. Have two children play computer. One child, the input, shows a combination of coins. Another child, the output, counts it.

3. Have two children play computer. One child, the input, shows an addition or subtraction, with regrouping. Another child, the output, finds the answer.

CHAPTER 12 OVERVIEW

This is an optional chapter that introduces multiplication with factors 5 or less. Multiplication is introduced through counting and addition. The fractions $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$ are recalled and then used to find fractional parts of a number or set.

The art theme for this chapter is "Animals, Birds, and Insects."

OBJECTIVES

A To find products, factors 5 or less
B To find missing factors in a multiplication sentence
C To find one half, one third or one fourth of a set
D To find one half, one third or one fourth of a number
E To find quotients, dividends 20 or less

VOCABULARY

factor 231
product 231
multiply 231
multiplication sentence 231
tenths 237
one tenth 238
missing factor 243
division 245
divided by 245
remainder 245
quotient 246
dividend 246

BACKGROUND

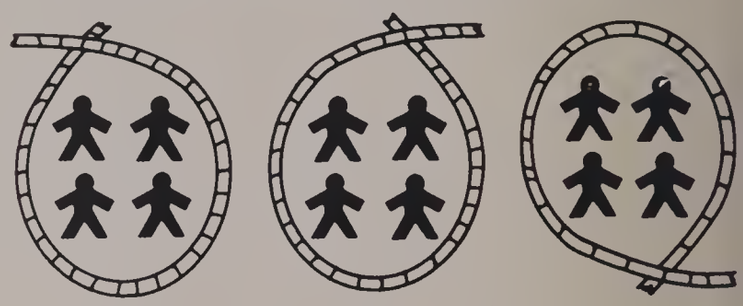
1. Multiplication is first introduced as an association with joining equivalent disjoint sets. Thus, three sets with four members in each leads to:

$$4 + 4 + 4 = 12$$
$$\text{three } 4\text{'s} = 12$$
$$3 \times 4 = 12$$

This does not hold for all multiplication sentences. Consider $1 \times 5 = 5$ and $0 \times 4 = 0$. These types of sentences may be developed from the use of the Commutative Property of Multiplication.

$1 + 1 + 1 = 3$	$0 + 0 + 0 = 0$
$3 \times 1 = 3$	$3 \times 0 = 0$
so, $1 \times 3 = 3$	so, $0 \times 3 = 0$

2. We do not attempt to relate the multiplication sentence form and the vertical form at this level. Consider the following picture, the multiplication sentence, and the corresponding vertical form that may be associated with it.



$3 \times 4 = 12$

$$\begin{array}{r} 4 \\ \times 3 \\ \hline 12 \end{array}$$

The sentence shows "3 times 4 is equal to 12." The vertical form shows "4 multiplied by 3 is equal to 12." This distinction may be confusing at this level so try and avoid it as much as possible. When solving problems, the child may write the form shown on the left when the form on the right should be written. At this level it may be best to accept either form without comment.

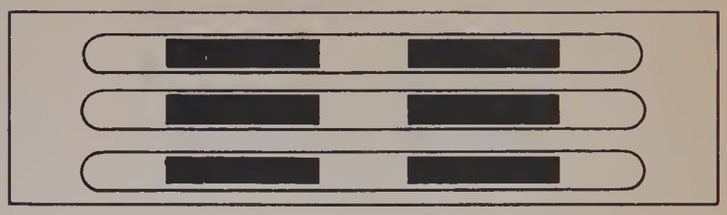
$$\begin{array}{r} 2 \\ \times 5 \\ \hline 10 \end{array} \qquad \begin{array}{r} 5 \\ \times 2 \\ \hline 10 \end{array}$$

MATERIALS

64 sticks
rubber bands
6 cans
12 pencils
25 blocks
8 straws
25 beans
5 empty boxes

BULLETIN BOARD

1. Use pictures drawn by the children. Each picture should be similar to:

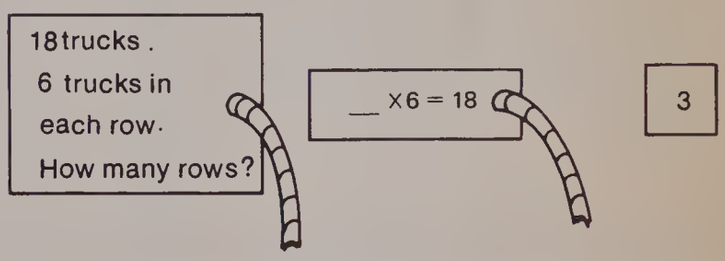


The children may use whatever medium suits them: crayons, tempera paint, fingerpaint, or an assemblage from materials in the art scrap box. Allow the children to choose whatever number of sets they wish as well as any number of members in each set. Attach a large letter of the alphabet to each picture. Children can then select a picture, copy its letter, and write two number sentences for it. For the picture above the children write:

$$2 + 2 + 2 = 6$$
three 2's = 6

Challenge the children to choose and work with several pictures.

2. Prepare materials for the child to help assemble. You should have several mini-problems of any easy-to-read size, number sentences like those shown below, numeral cards, and yarn. (All problems and sentences should deal with missing factors only.) Make three columns on the bulletin board with ample space between each. Attach yarn to each problem and sentence. The child uses the yarn to match a problem, sentence and missing factor (answer). For example:



3. Have the child help construct a very large multiplication table. Such a bulletin board is not only a learning experience in its preparation, but continues as a constant source of reference as well as a natural focus for quick basic facts games.

4. The art theme for this unit is animals, birds, and insects. Children may enjoy creating a bulletin board with this theme.

OBJECTIVE

To find the missing numbers in sentences such as 2 + 2 + 2 = ___ and three 2's = ___

PACING

Level A	(Initial Activities only)
Level B	(Initial Activities only)
Level C	229 All (1-2 guided)
	230 All

MATERIALS

6 cans, 12 pencils

BACKGROUND

See Item 1 in the Chapter Overview Background.

SUGGESTIONS

Initial Activities 1. Show 3 cans. Place 1 pencil in one can, 2 pencils in another, and 3 pencils in a third. Assist the child in giving the number of each set. Ask the child to find how many there are in all. Assist the child in writing:

$$1 + 2 + 3 = 6$$

Preserve the cans and sentence.

Display 3 more cans with 2 pencils in each can. Ask the child to tell how many sets there are and the number in each set. Have the child find how many there are in all. Guide the child in writing:

$$2 + 2 + 2 = 6$$

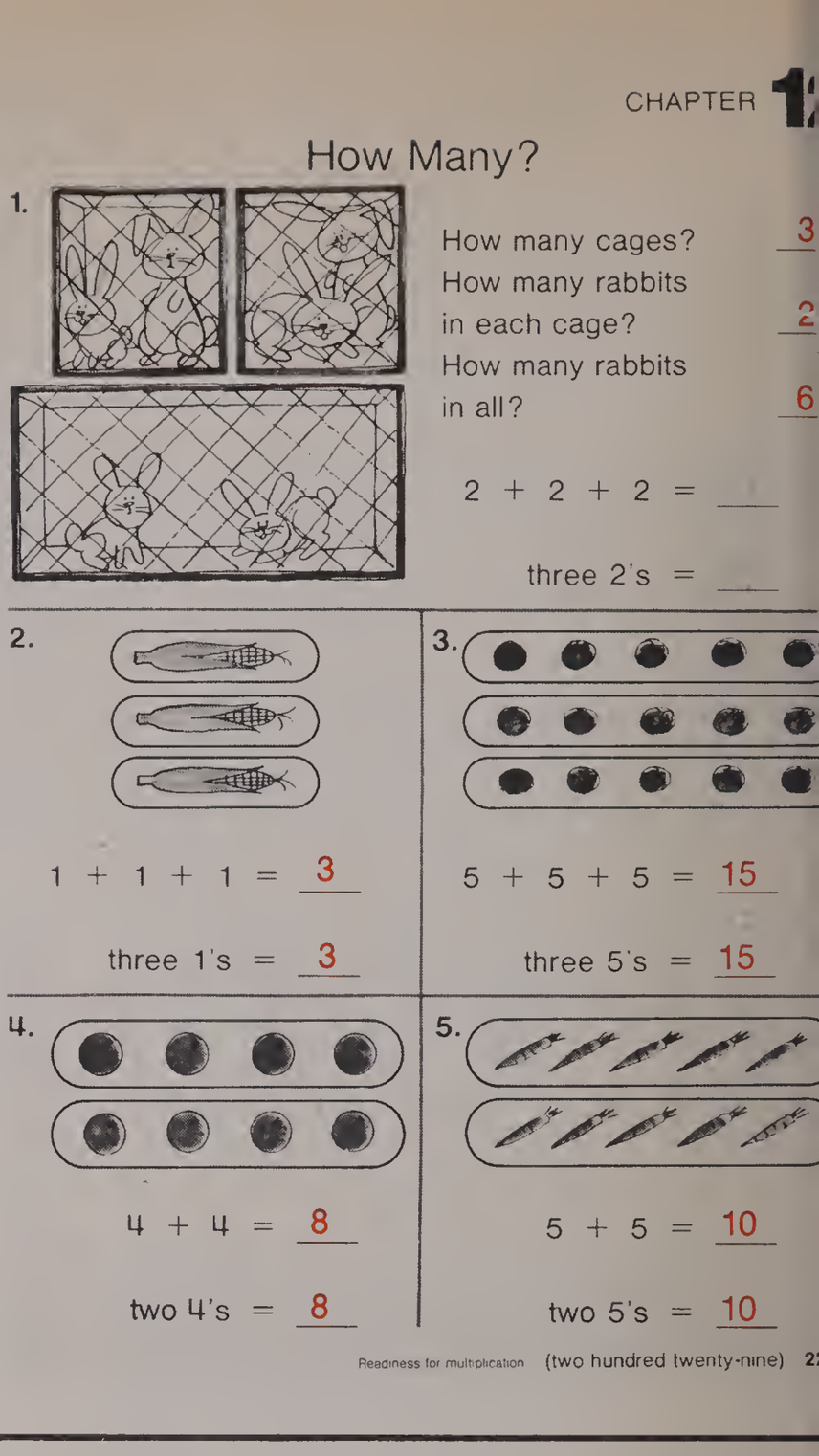
Call attention to the two sentences. Elicit the idea that the addends in the first sentence are not alike, but in the second sentence the addends are all the same.

Direct attention to the second sentence, 2 + 2 + 2 = 6. Ask: "How many times is two an addend?" Then ask, "Three twos is equal to what number?" Write: three 2's = 6 below 2 + 2 + 2 = 6. Elicit the ideas that: (a) 3 tells how many sets there are, (b) 2 tells how many in each set, and (c) 6 tells how many in all.

2. Repeat the above activity for:

$$3 + 3 + 3 + 3 = 12$$

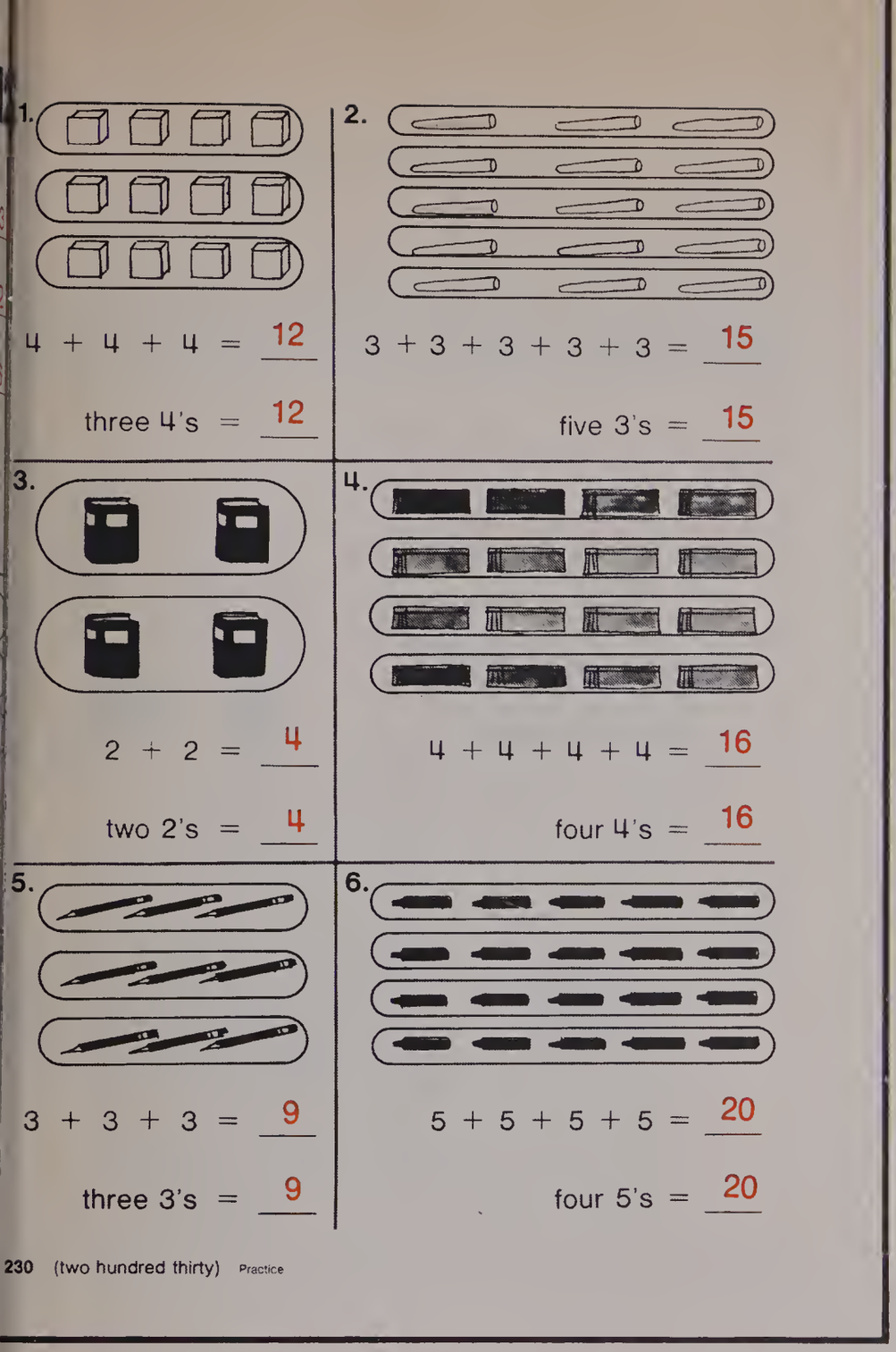
four 3's = 12



Using the Book Panel 1: Read or have the child read each question. Then have the child write the answer to each question. Ask the child to complete the addition sentence. Ask, "Each addend is what number? (2) How many times is 2 an addend? (3) Two plus 2 equals what number? (4) Four plus 2 equals what? (6)" Have the child trace 6. Then ask, "Three twos is equal to what? (6)" Trace 6.

Panel 2: Ask, "How many rows (sets) of ears of corn? (3) How many ears of corn in all? (3) One plus 1 plus 1 is equal to what? (3)" Have the child write 3 in the blank in the addition sentence. Ask, "Three ones is equal to what (3)" Have the child write 3 in the last number sentence.

Panels 3–5: For each panel, have the child write the sum. Then have the child complete the last number sentence. You may have the child use the pictures to check the answers.



Using the Book Panels 1-6: For each panel, have the child find the sum. Then have the child complete the last number sentence. Have the child use the pictures to check the answers.

ACTIVITIES

1. Perhaps the child would enjoy Bulletin Board suggestion 1 described in the Chapter Overview.

2. Provide the child with more multiplication readiness experiences like those in Panels 1-6 on page 230. Encourage the child to illustrate each experience using blocks.

3. Two children may play the computer game. The children take turns being the input and the output. The input says, "three fours." Then the output says, "twelve."

4. Ask the child to write an addition sentence for each of the following sentences and give the missing numbers.

four 2's = ___	four 3's = ___
two 3's = ___	five 1's = ___
three 4's = ___	six 2's = ___
two 1's = ___	five 2's = ___
five 4's = ___	four 4's = ___

OBJECTIVE

To find products

PACING

Level A	(Initial Activities only)
Level B	(Initial Activities only)
Level C	231 All (1-2 guided)
	232 All (1 guided)

VOCABULARY

factor, product, multiply, multiplication sentence

MATERIALS

12 blocks

SUGGESTIONS

Initial Activities 1. Use three bundles of sticks with 4 sticks in each bundle to develop:

$4 + 4 + 4 = 12$
three 4's = 12

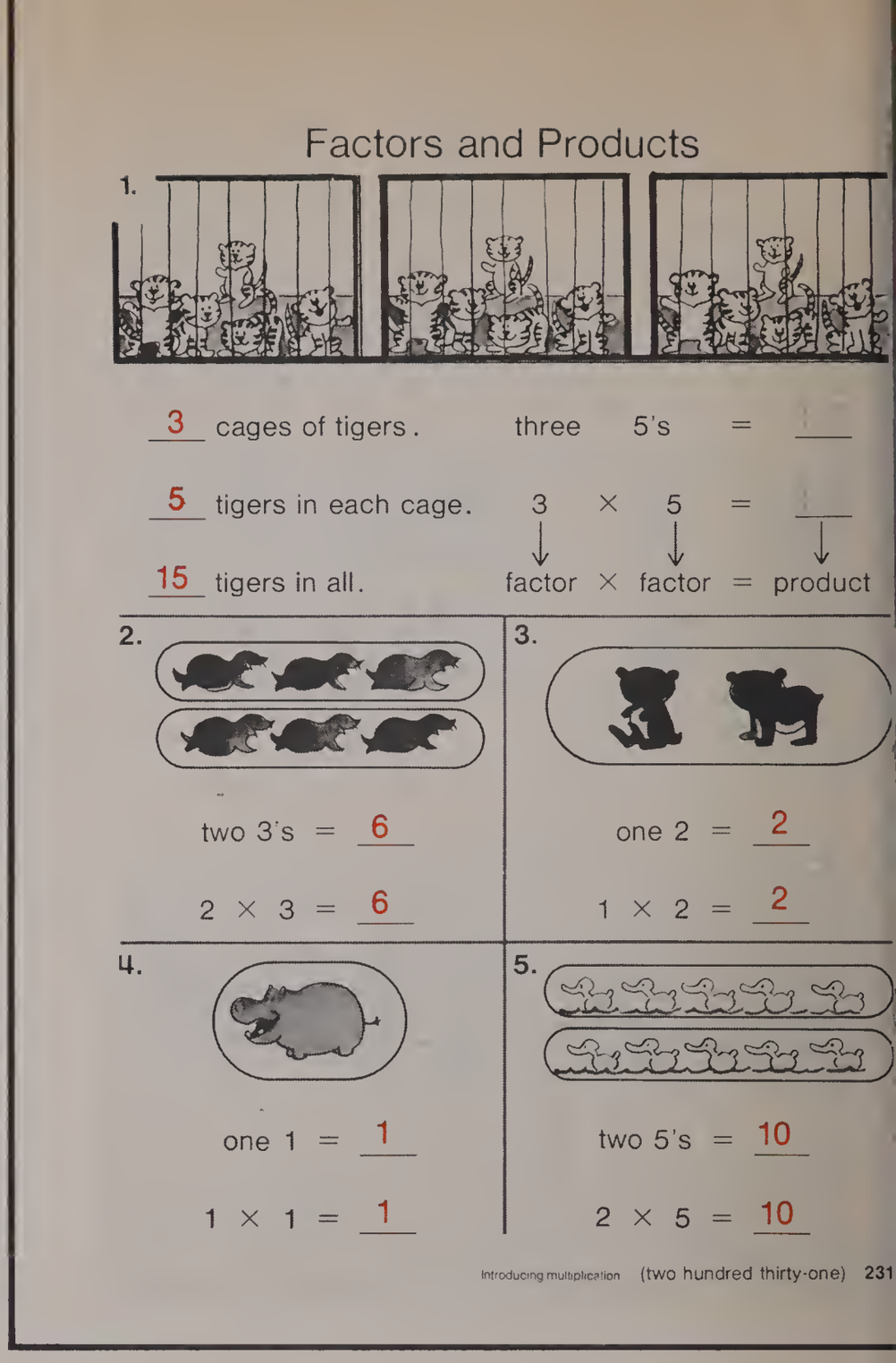
Tell the child there is another way to show that "three 4's is equal to 12." Write $3 \times 4 = 12$. Explain to the child that this is a multiplication sentence. Discuss the idea that "3 ×" means that we use the same addend (in this case 4) three times. Assist the child in reading the multiplication sentence "3 times 4 is equal to 12." Also tell the child that the sign × means multiply.

Review that in the sentence $3 + 4 = 7$ the numbers 3 and 4 are called addends and 7 is called the sum. Explain that in the multiplication sentence $3 \times 4 = 12$, the numbers 3 and 4 are called factors and the 12 is called the product.

2. Display two sets of blocks with five blocks in each set. Ask, "How many sets? (2) How many in each set? (5) How many in all?" Write:

two 5's = ___
2 × 5 = ___

Have the child give the missing numbers. Ask the child to name the factors and the product.

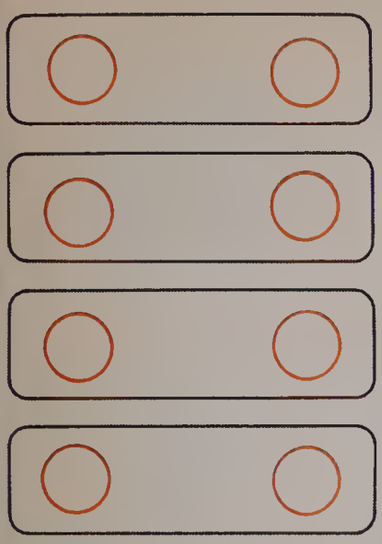


Using the Book Panel 1: Guide the child in completing each sentence on the left. Call attention to the first sentence on the right. Ask, "Three fives is equal to what? (15)" Have the child trace 15 in the blank. Tell the child, "The second number sentence is another way to show three fives." Have the child trace 15 in the blank. Say, "We read it: 3 times 5 is equal to 15. It is called a multiplication sentence." Identify the factors, the × sign, and product for the child.

Panels 2-5: Tell the child to write the answer in each sentence. You may have the child use the pictures to check the answers. For example, in panel 2, "Read the multiplication sentence. What are the factors? (2 and 3) How is the first factor, 2, related to the picture? (the number of rows, or sets) How is the second factor, 3, related to the picture? (the number of seals in each row, or set) What is the product? (6) How is the product related to the picture? (the number of seals in all)" Continue in this manner for panels 3-5.

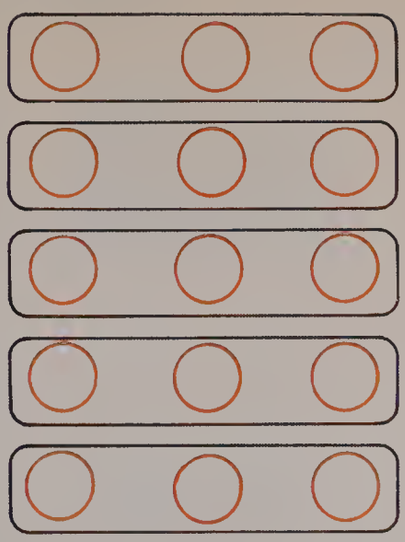
Multiply. Draw a picture for each sentence.

1.



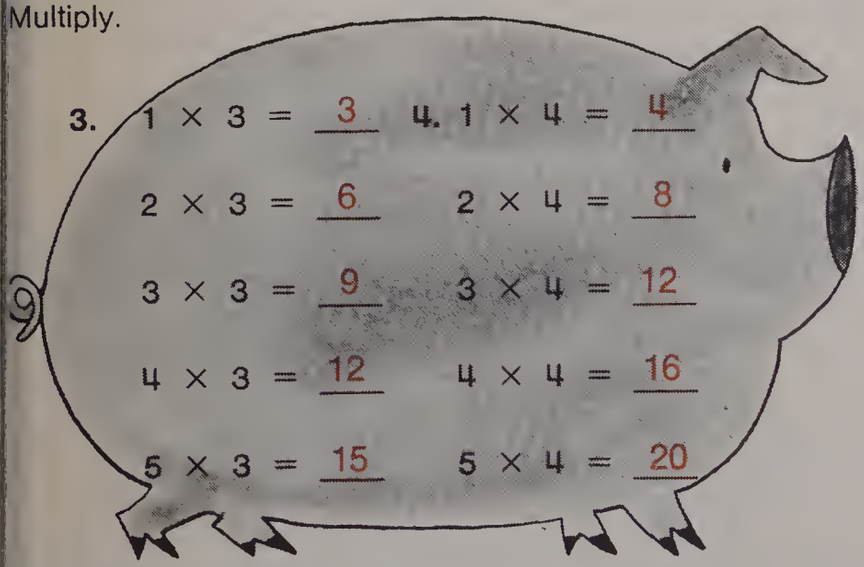
4 × 2 = 8

2.



5 × 3 = 15

Multiply.



3.	1 × 3 = 3	4. 1 × 4 = 4	
	2 × 3 = 6	2 × 4 = 8	
	3 × 3 = 9	3 × 4 = 12	
	4 × 3 = 12	4 × 4 = 16	
	5 × 3 = 15	5 × 4 = 20	

Using the Book Panels 1-2: For panel 1, call attention to the multiplication, 4 × 2. Ask, "What is the first factor? (4) How many sets are drawn above? (4) What is the second factor? (2) How many members should you draw in each set? (2) Now you can use the picture to complete the sentence. How many members did you draw in all? (8)" Have the child write 8 in the blank and then read the multiplication sentence. Continue with panel 2 in a similar way.

Panels 3-4: Have the child find each product. You may wish to discuss the pattern in each panel.

Elicit the ideas that, for the multiplication sentence 2 × 5 = 10, the 2 tells the number of sets, the × means we multiply, the 5 tells the number of members in each set, and the 10 tells how many members there are in all.

ACTIVITIES

1. Give the child 10 blocks. Write:

three 2's = ___
3 × 2 = ___

Ask the child to find the missing numbers and use the blocks to illustrate the multiplication sentences.

2. Give the child 20 blocks. Write:

three 4's = ___
3 × 4 = ___

Ask the child to find the missing numbers and use the blocks to illustrate the multiplication sentences.

3. Ask the child to find the pattern in each of the Panels 3 and 4 on page 232 (counting by threes and fours). Then duplicate a page of exercises similar to those in Panels 3 and 4. Use 1, 2, and 5 as the common factors.

4. Create some simple word problems in which multiplication may be used to solve the problems. Examples: What is the cost of 3 pencils at 5¢ each? Each can of tennis balls has 3 tennis balls. How many tennis balls are in 4 cans of tennis balls?

RELATED AIDS

ACT. MASTERS—55-57.
—Gen. Use 13.
BFA COMP LAB I—87-89.

OBJECTIVE

To know that changing the order of the factors does not change the product

PACING

Level A (Initial Activities only)
Level B (Initial Activities only)
Level C All (1-2 guided)

MATERIALS

25 blocks

SUGGESTIONS

Initial Activity Show three sets of blocks with 4 blocks in each set. Develop the sentences:

three 4's = 12
3 × 4 = 12

Next show four sets of blocks with 3 blocks in each set and write:

four 3's = 12
4 × 3 = 12

Ask the child to read each sentence and name the first factor, the second factor, and the product in each sentence. Elicit the idea that changing the order of the factors does not change the product.

ACTIVITIES

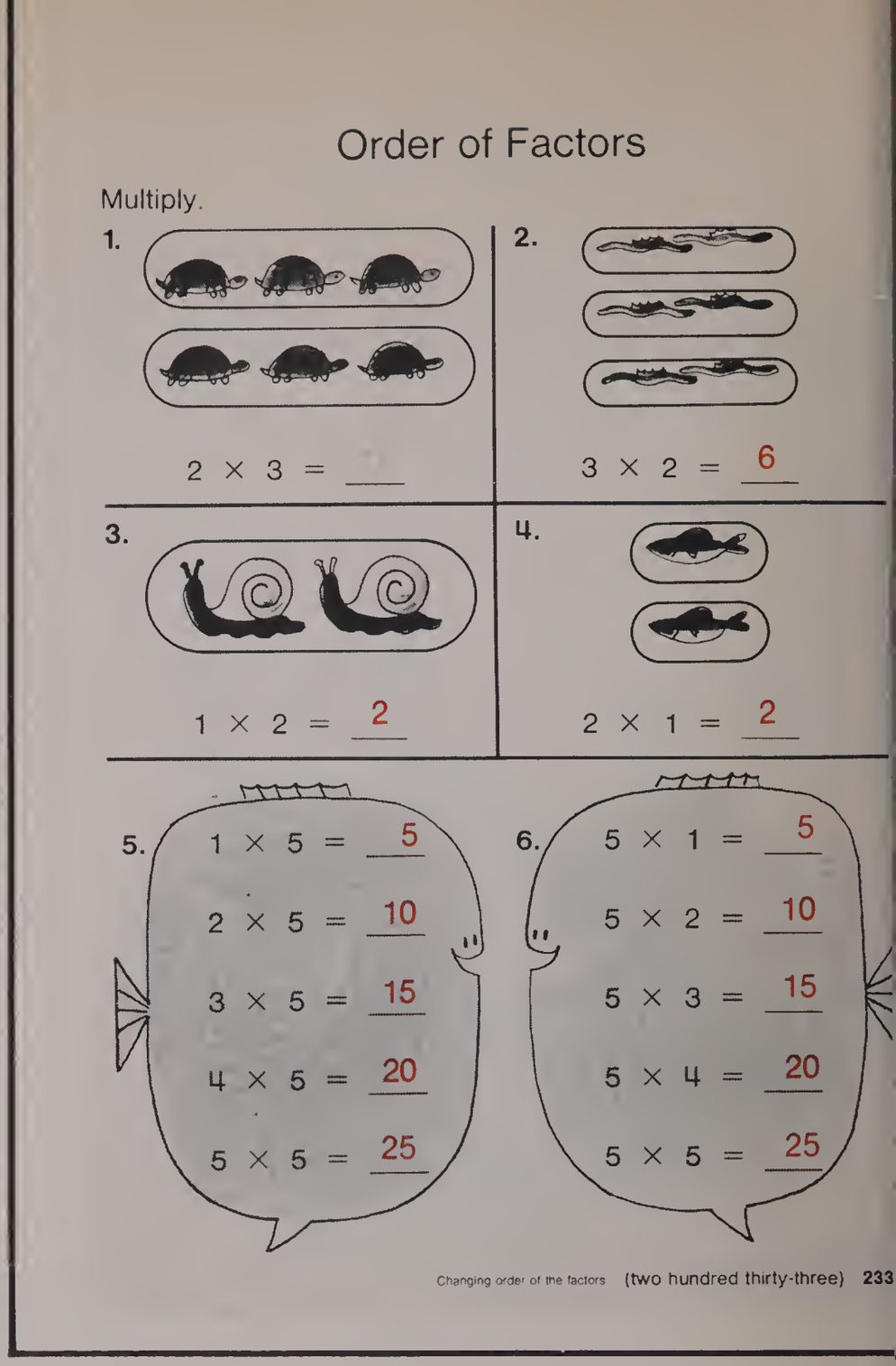
1. Write 2 × 3 = ___ and 3 × 2 = ___. Have the child use blocks to illustrate each sentence.

2. Show a card with three rows of large dots and 5 dots in each row. Write: 3 × 5 = ___. Have the child give the product, 15. Challenge the child to move the card to show 5 × 3 = 15. (The child may rotate the card ninety degrees; then there are 5 rows and 3 dots in each row.)

3. Show two sets of blocks with 4 blocks in each set. Write: 2 × 4 = ___. Have the child give the product, then rearrange the blocks to show 4 × 2 = 8. (The child should show four sets with 2 blocks in each set.)

RELATED AIDS

ACT. MASTERS—55-57.
—Gen. Use 13.
BFA COMP LAB I—87-89.



Using the Book Panel 1: Ask, "How many sets? (2) How many in each set? (3) How many in all? (6) Two threes is equal to what? (6) Two times 3 is equal to what? (6)" Have the child trace 6 in the blank and read the multiplication sentence.

Panel 2: Guide the child as in panel 1. Have the child write 6 in the blank. Then ask, "Are the factors the same in panels 1 and 2? (yes) Are the factors in the same order in panels 1 and 2? (no) Did changing the order of the factors change the product? (no)"

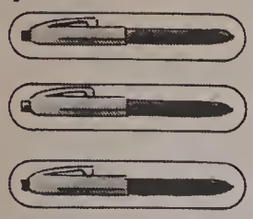
Panels 3-4: Have the child name the first factor, then the second factor, and then the product in each multiplication sentence. Then ask, "Did changing the order of the factors change the product? (no)"

Panels 5-6: Have the child write the products. Then have the child pair each sentence on the left with a sentence on the right. The pair should show the same product, even through the order of factors may change.

One as a Factor

Multiply.

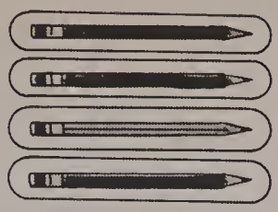
1.



3 × 1 = 3

so 1 × 3 = 3

2.



4 × 1 = 4

so 1 × 4 = 4

3. 5 × 1 = 5

4 × 1 = 4

3 × 1 = 3

2 × 1 = 2

1 × 1 = 1

4. 1 × 5 = 5

1 × 4 = 4

1 × 3 = 3

1 × 2 = 2

1 × 1 = 1

5. 5 × 2 = 10

4 × 2 = 8

3 × 3 = 9

6. 1 × 1 = 1

1 × 4 = 4

5 × 3 = 15

Using the Book Panel 1: Have the child tell the number of sets, the number of pens in each set, and the number of pens in all. Ask, "Three ones is equal to what number? (3) Three times 1 is equal to what number? (3)" Have the child trace 3 in the first sentence. Ask, "What are the factors? (3 and 1) What is the product? (3) If the order of the factors is changed, will the product change? (no) Then one times 3 is equal to what number? (3)" Have the child trace 3 in the second blank

Panel 2: Follow procedures similar to those in panel 1. After the answers are written, have the child read the multiplication sentences in panels 1 and 2. Then ask, "When one of two factors is the number 1, is the product the same number as the other factor? (yes)"

Panels 3-6: Have the child find the products. After the child has completed panels 3 and 4, ask "When one of two factors is the number 1, what is the product? (the same number as the other factor)"

OBJECTIVE

To know when one factor is 1, the product is equal to the other factor

PACING

Level A (Initial Activities only)
Level B (Initial Activities only)
Level C All (1 guided)

BACKGROUND

Refer to Item 1 in Background of the Chapter Overview.

SUGGESTIONS

Initial Activities Have the child find the sum and product in each of the following pairs of sentences:

1 + 1 = ___ 1 + 1 + 1 = ___
2 X 1 = ___ 3 X 1 = ___

Then write:

2 X 1 = ___ 3 X 1 = ___
1 X 2 = ___ 1 X 3 = ___

Have the child find the products in each pair of sentences. Ask, "When 1 is one factor and 2 is the other factor, what is the product? (2)" Ask similar questions about each of the other pairs of multiplication sentences. Then ask, "When 1 is one of the two factors, what is the product? (the same number as the other factor)"

ACTIVITIES

1. Involve the child in Bulletin Board suggestion 4 in the Chapter Overview.

2. Give the child pairs of multiplication sentences, such as:

3 X 2 = ___ 5 X 1 = ___ 2 X 4 = ___
2 X 3 = ___ 1 X 5 = ___ 4 X 2 = ___

Have the child find the products. Provide blocks if necessary.

3. Ask the child to find the pattern in each of the Panels 3 and 4.

4. Challenge the child with this problem: "John is 4 years older than Maria. In 2 years John will be two times as old as Maria. How old is each child now? (2 and 6)"

RELATED AIDS

ACT. MASTERS—55-57.
—Gen. Use 13.
BFA COMP LAB I—87-89.

OBJECTIVE

To know when 0 is one factor, the product is 0

PACING

Level A (Initial Activities only)
Level B (Initial Activities only)
Level C All (1 guided)

MATERIALS

5 cans, 8 straws

SUGGESTIONS

Initial Activities Show 4 cans with 2 straws in each can. Develop the sentences:

$2 + 2 + 2 + 2 = 8$
four 2's = 8
$4 \times 2 = 8$ so, $2 \times 4 = 8$

Remove 1 straw from each can, and develop similar sentences for four 1's. Then remove another straw from each can and develop the sentences:

$0 + 0 + 0 + 0 = 0$
four 0's = 0
$4 \times 0 = 0$ so, $0 \times 4 = 0$

Next write and complete:

$0 + 0 =$ ___
$2 \times 0 =$ ___ so, $0 \times 2 =$ ___

Explain that when one factor is 0, the product is always 0.

ACTIVITIES

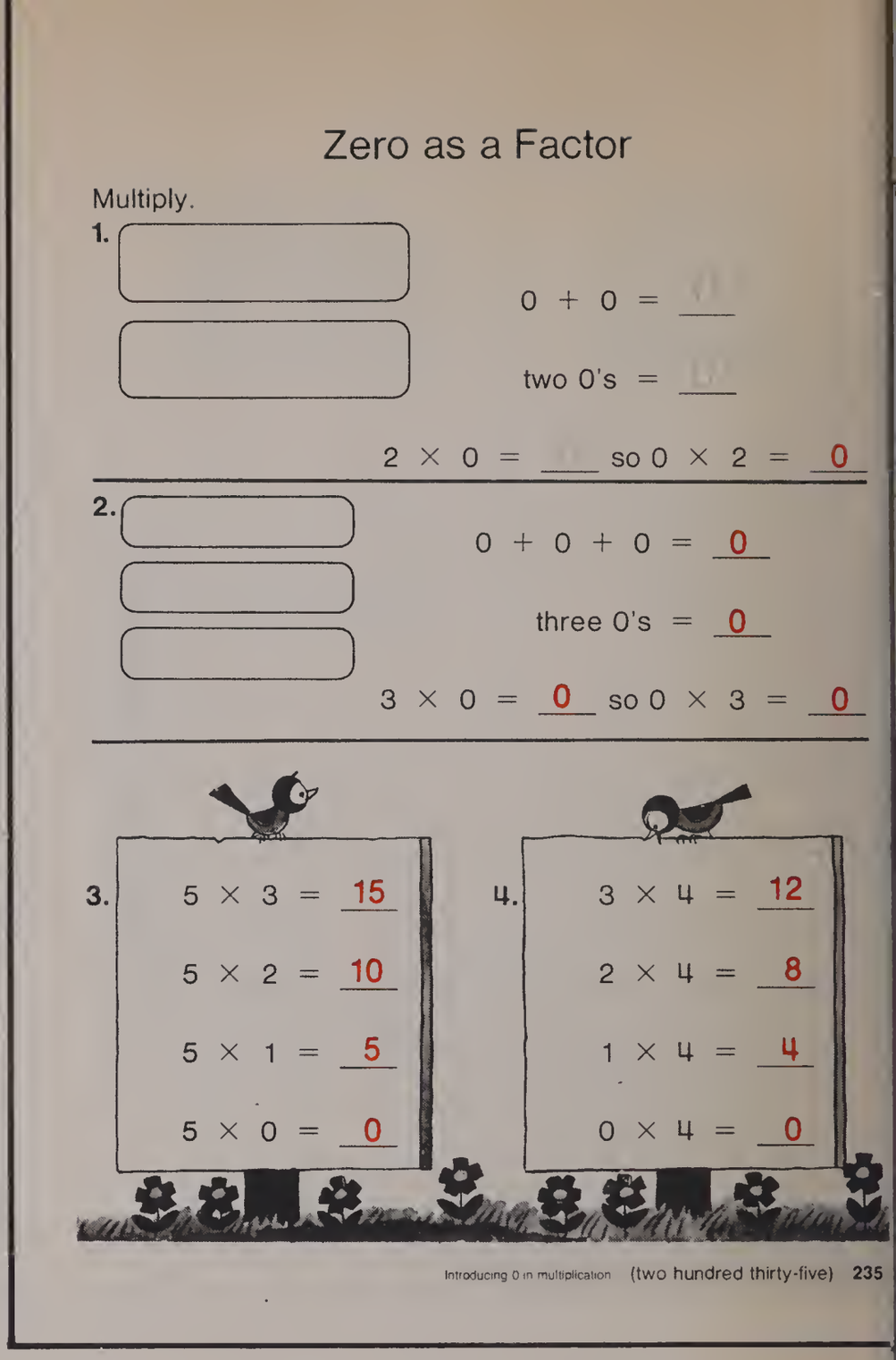
1. Practice counting by fives with the game Zip Up described in the Activity Reservoir.

2. Use Bulletin Board suggestion 1 in the Chapter Overview.

3. Play Bingo as described in the Activity Reservoir. Include multiplication.

RELATED AIDS

ACT. MASTERS—55-57.
—Gen. Use 13.
BFA COMP LAB I—87-89.



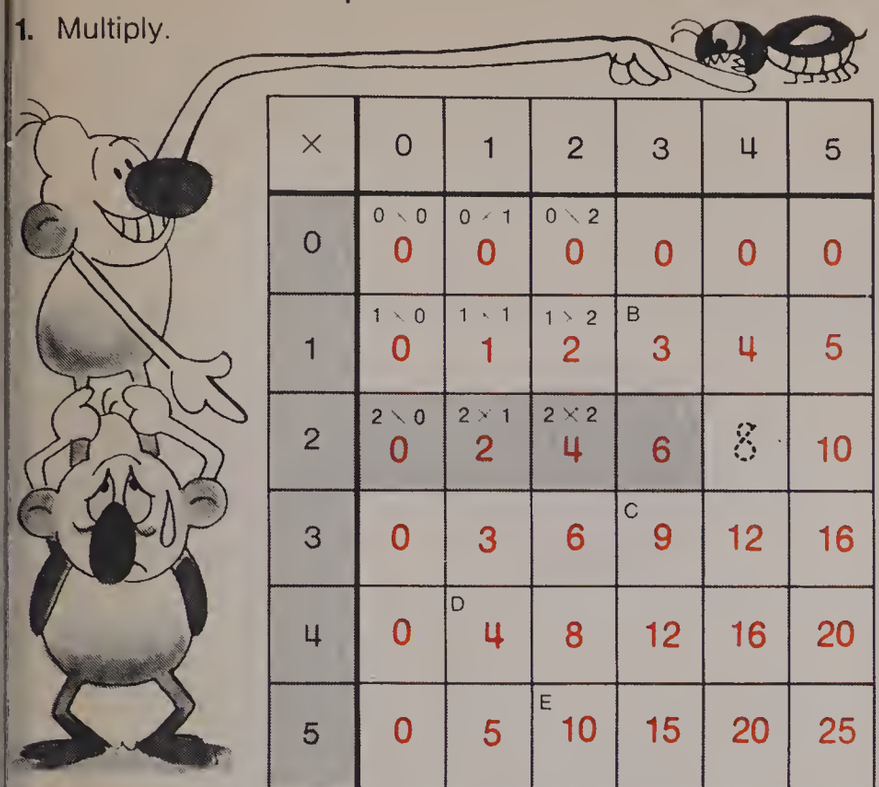
Using the Book Panel 1: Ask, "How many sets are there? (2) How many members in each set? (none) Then what number describes each set? (0) What is the number of members in all? (0) Zero plus 0 is equal to what number? (0)" Have the child trace 0 as the answer in the addition sentence. Ask, "How many addends? (2) What number is each addend? (0) What is the sum? (0) Two zeros is equal to what? (0)" Have the child trace 0 in the second sentence. Then have the child complete the two multiplication sentences at the bottom of the panel.

Panel 2: Adapt the procedures in panel 1. When the answers for panel 2 have been written, ask, "When one of two factors is the number 0, what is the product? (0)"

Panels 3-4: Have the child write the products. Discuss the patterns in panels 3 and 4. For example, for panel 3 ask, "How do the factors change? (The second factor is one less each time.) How does the product change? (The product is 5 less each time.)"

Multiplication Table

1. Multiply.



×	0	1	2	3	4	5
0	0 × 0 = 0	0 × 1 = 0	0 × 2 = 0	0	0	0
1	1 × 0 = 0	1 × 1 = 1	1 × 2 = 2	B 3	4	5
2	2 × 0 = 0	2 × 1 = 2	2 × 2 = 4	6	8	10
3	0	3	6	C 9	12	16
4	0	D 4	8	12	16	20
5	0	5	E 10	15	20	25

2. Find the missing factors.

2 × 0 = 0

2 × 1 = 2

2 × 2 = 4

2 × 3 = 6

0 × 4 = 0

1 × 4 = 4

2 × 4 = 8

3 × 4 = 12

Using the Book Panel 1: Tell the child, "When all the squares are filled in, we will have a multiplication table. For a multiplication, the first factor is shown in the blue (left) column, the second factor is shown in the yellow (top) row, and the product is shown in one of the squares to the right of the blue column and below the yellow row." Write 2 × 4 = ___ on the chalkboard. Ask, "What is the first factor? (2) What is the second factor? (4)" Then say, "In panel 1, find the first factor, 2, in the blue column. Find the second factor, 4, in the yellow row. Trace with one finger to the right from the 2 and another finger down from the 4. The product is written in the frame where your fingers meet. What is the product? (8) Trace the dashed 8 in the square. Two times 4 is equal to what number? (8)"

In a similar manner, you may assist the child in giving the products that go in squares B, C, D, and E.

Panel 2: Have the child write the missing factors. The child may use the table to find or check answers.

OBJECTIVE

To make a multiplication table

PACING

Level A (Initial Activities only)
Level B (Initial Activities only)
Level C All (1 guided)

SUGGESTIONS

Initial Activities Prepare a grid similar to that on page 236. Write 2 × 3 = ___. Have the child name the first factor and touch the 2 on the left. Have the child name the second factor and then touch the 3 at the top. Point out that the row with 2 on the left meets the column with 3 at the top. Explain that this is the frame in which we give the product of 2 × 3, which is 6. Then the child writes 6 in the frame.

Repeat this activity for factors less than 6.

ACTIVITIES

1. Create dot pictures for counting by twos to 24 and by fives to 25.

2. Construct jigsaw puzzle practice cards for products with factors 5 or less. Have the child use the cards to practice giving products for factors less than 6.

3. Involve the child in Bulletin Board suggestion 3 in the Chapter Overview.

RELATED AIDS

ACT. MASTERS—55-57.
—Gen. Use 13.
BFA COMP LAB I—87-89.

OBJECTIVE

To identify 1/10 of a picture

PACING

Level A	All (1-3 guided)
Level B	All (1-3 guided)
Level C	All (1-2 guided)

MATERIALS

paper pie plates, egg cartons, 11 blocks

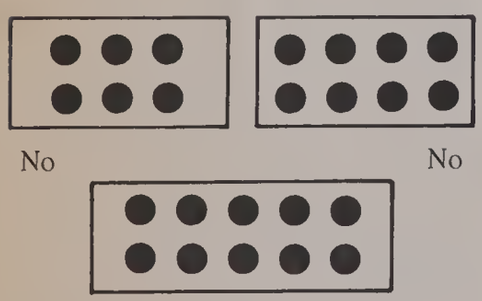
VOCABULARY

tenths

SUGGESTIONS

Initial Activities 1. Show a pie plate separated into tenths by dotted lines. Ask, "How many parts? (10) Are the parts the same size?" (yes) Explain that each part is one tenth of the plate. Write 1/10 on the board and have the child copy it.

2. Show 5 different egg carton holders cut to show 6 places, 8 places and 10 places. Ask, "Are there 10 parts? Are they the same size? Is each part one tenth? Why or why not?" (Note that 6 parts and 8 parts are not tenths)



No No

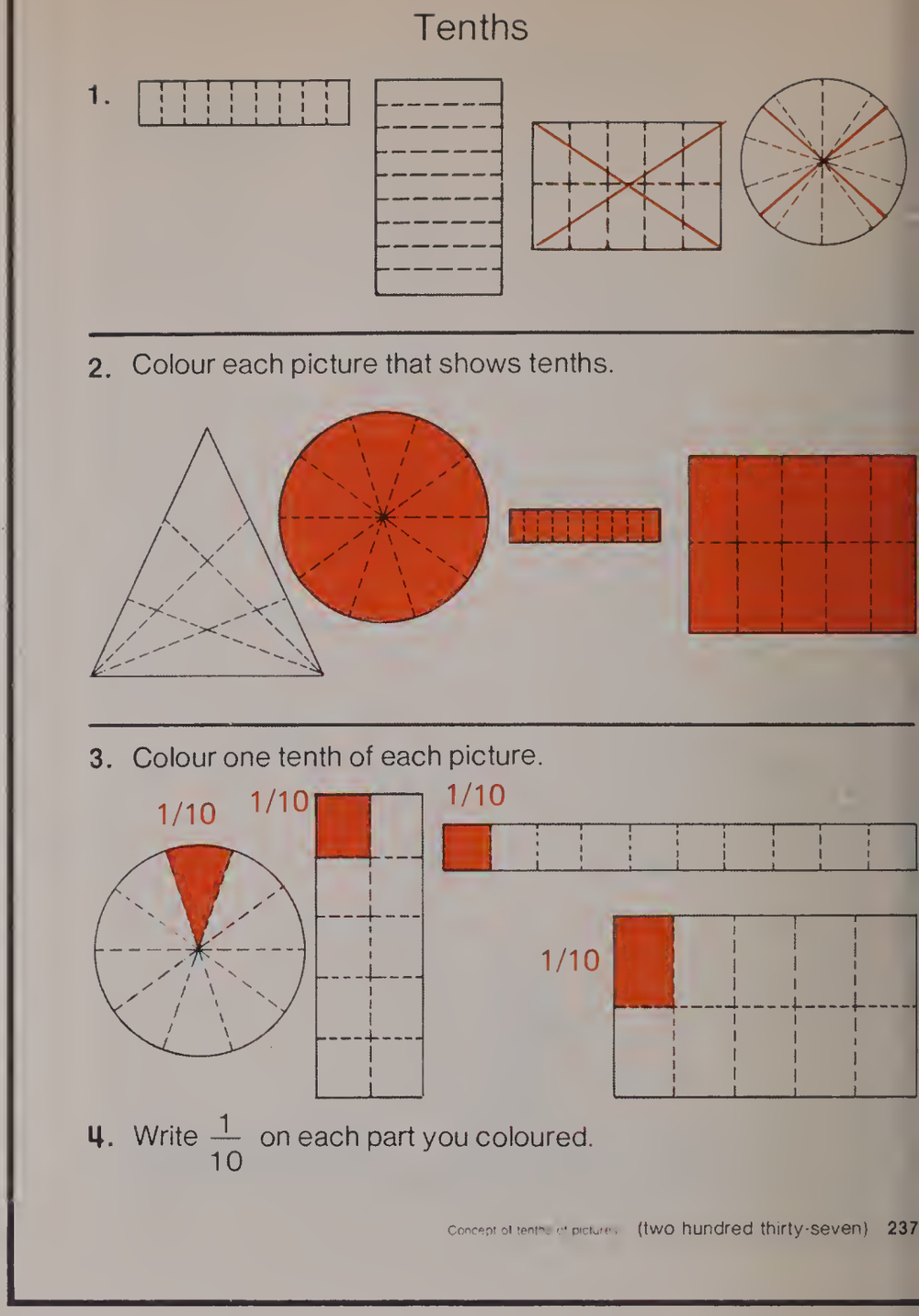
Yes

ACTIVITIES

1. Show pictures of objects, some of which are separated into tenths and some not. Have the child identify those that are separated into tenths.

2. Give the child ten blocks and have the blocks put in a row. Ask, "How many blocks in a row?" Have the child show one tenth of the blocks by picking up one block.

3. Give the child ten blocks of the same color. Make a row of blocks. Take one block of a different colour and show one tenth of the row by inserting an odd colored block in the row.



Using the Book Panel 1: Have the child look at the first picture. Explain that we are going to mark with an X each picture that shows ten equal parts. Ask, "How many parts? (9) Should we mark it with an X? (no) Why?" (not 10 parts) Look at the second picture. Ask, "How many parts? (9) Do we color the rectangle? (no) Why?" (not 10 parts) Look at picture three. Ask, "How many parts? (10) Should we mark it? (yes) Why?" (10 parts) Now look at the last picture. Ask. "How many parts? (10) Should we mark it?" (yes)

Panel 2: Have the child look at the triangle. Ask, "Into how many parts is the triangle divided?" (9) Explain that only figures divided into 10 parts are colored. Ask. "Do we color the triangle? (no) Why?" (9 parts, not 10) Then have the child count the number of parts in the circle. Ask, "How many parts? (10) Do we color the circle? (yes) Why?" (10 parts) Continue with the next two shapes.

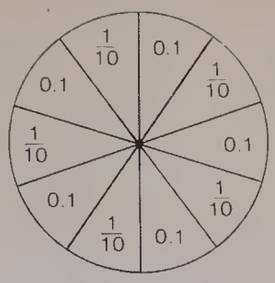
Panels 3-4: Tell the child to find 1/10 of each figure; color 1/10 and write 1/10 on the colored part.

RELATED AIDS

ACT. MASTERS—17.

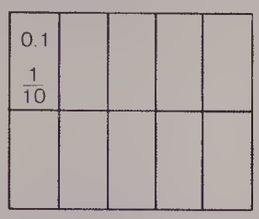
Decimals

. How many parts?
Are the parts the same size?
We write: $\frac{1}{10}$ or 0.1



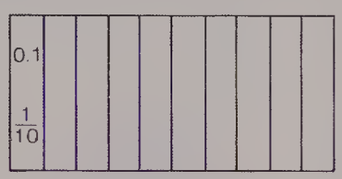
. How many parts? 10

Are the parts the same size? yes
Write: $\frac{1}{10}$ or
10 0.1



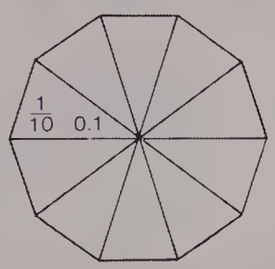
. How many parts? 10

Are the parts the same size? yes
Write: or
1/10 0.1



. How many parts? 10

Are the parts the same size? yes
Write or
1/10 0.1



238 (two hundred thirty-eight) Writing tenths as 0.1

Using the Book Panel 1: Ask, "How many parts is the circle divided into? (10). Are all the parts the same size? (yes). Explain that one tenth can be written $\frac{1}{10}$ and 0.1. Write $\frac{1}{10}$ and 0.1 on the board. Have the child read around the circle saying 'one tenth' or 'zero point one' as the sections are marked.

Panels 2-4: Adapt the procedure from panel 1. Have the child write 0.1 in each section that is one tenth of the figure.

OBJECTIVE

To identify $\frac{1}{10}$ of a picture. To write $\frac{1}{10}$ as 0.1

PACING

Level A	All
Level B	All
Level C	All

VOCABULARY

one tenth

MATERIALS

paper

SUGGESTIONS

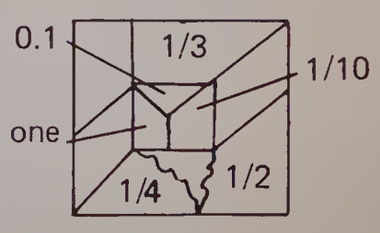
Initial Activity Give the child a strip of paper separated by dotted lines into ten equal parts. Ask, "How many parts are there? (10) Are they all the same size?" (yes) Elicit from the student that we can write one tenth as $\frac{1}{10}$ (page 137) and have the student write $\frac{1}{10}$ on each section. Explain to the child that we can also write one tenth as 0.1. Write 0.1 on the board. Have the child write 0.1 beside $\frac{1}{10}$ on each section of paper.

ACTIVITIES

1. Give the child sheets of paper with various shapes printed on them, some of which are separated into tenths. Have the child identify those separated into tenths by writing 0.1 on each tenth.

2. Using a picture separated into many different parts, making the picture unrecognizable to the child, have the child color all parts marked one tenth to discover the picture. The parts to be solved can be marked 0.1 or $\frac{1}{10}$ or one tenth.

e.g.



OBJECTIVE

To identify and color tenths of a picture using decimal notation

PACING

Level A	All (1-2 guided)
Level B	All (1-2 guided)
Level C	All (1 guided)

MATERIALS

10 yellow blocks, 10 other blocks, matching cards

SUGGESTIONS

Initial Activities 1. Give the child a set of 10 blocks, all of which are the same color. Have the child line the blocks up in a row. Tell the child to remove one of the blocks. Ask, "How many blocks have been removed?" Have the child indicate that one tenth of the blocks have been removed. Write 0.1 on the board. Ask, "How many blocks remain? (9) How many blocks were there in the beginning?" (10). The child knows how to write one tenth. (0.1) Elicit from the child a way that nine tenths might be written (0.9). Repeat this entire procedure removing 2, 3, 4, etc., blocks and counting the remainder.

2. Have the child complete the following chart through 0.9, noting the similarity to counting by ones.

$\frac{1}{10}$ 0.1

$\frac{2}{10}$ 0.2

ACTIVITIES

1. Prepare 9 pairs of cards. For each pair show a picture separated into parts and a decimal numeral matching the picture. Example:

0.3

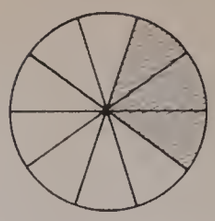
Let two children play a card game. Shuffle the cards. Each child is dealt 4 cards. The remaining cards are used for drawing. Children take turns asking for a specific card or drawing from the deck if the opponent does not have the asked-for card. As pairs are matched they are put to one side. The first child to get rid of all cards from the hand wins.

2. Write sequences of numbers such as: 0.3 __ __ __ 0.7. Challenge the child to fill in the blanks.

3. Give the child 10 yellow blocks and 10 other blocks. Have the child make a row of 10 yellow blocks. Write a numeral on the board. (0.3) Have child show three tenths by replaci three of the yellow blocks with oth blocks. Repeat this procedure for decimal numerals.

More Decimals

Colour to show 0.3.



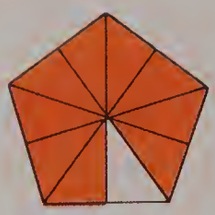
Colour to show each.

1. 0.2

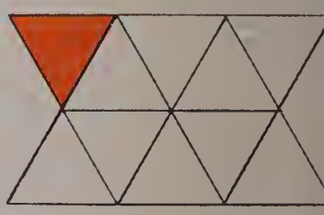
2. 0.5

3. 0.8

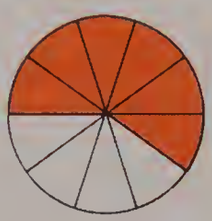
4. 0.9



5. 0.1



6. 0.6



7. 0.4

Activity Showing decimals (two hundred thirty-nine) 23

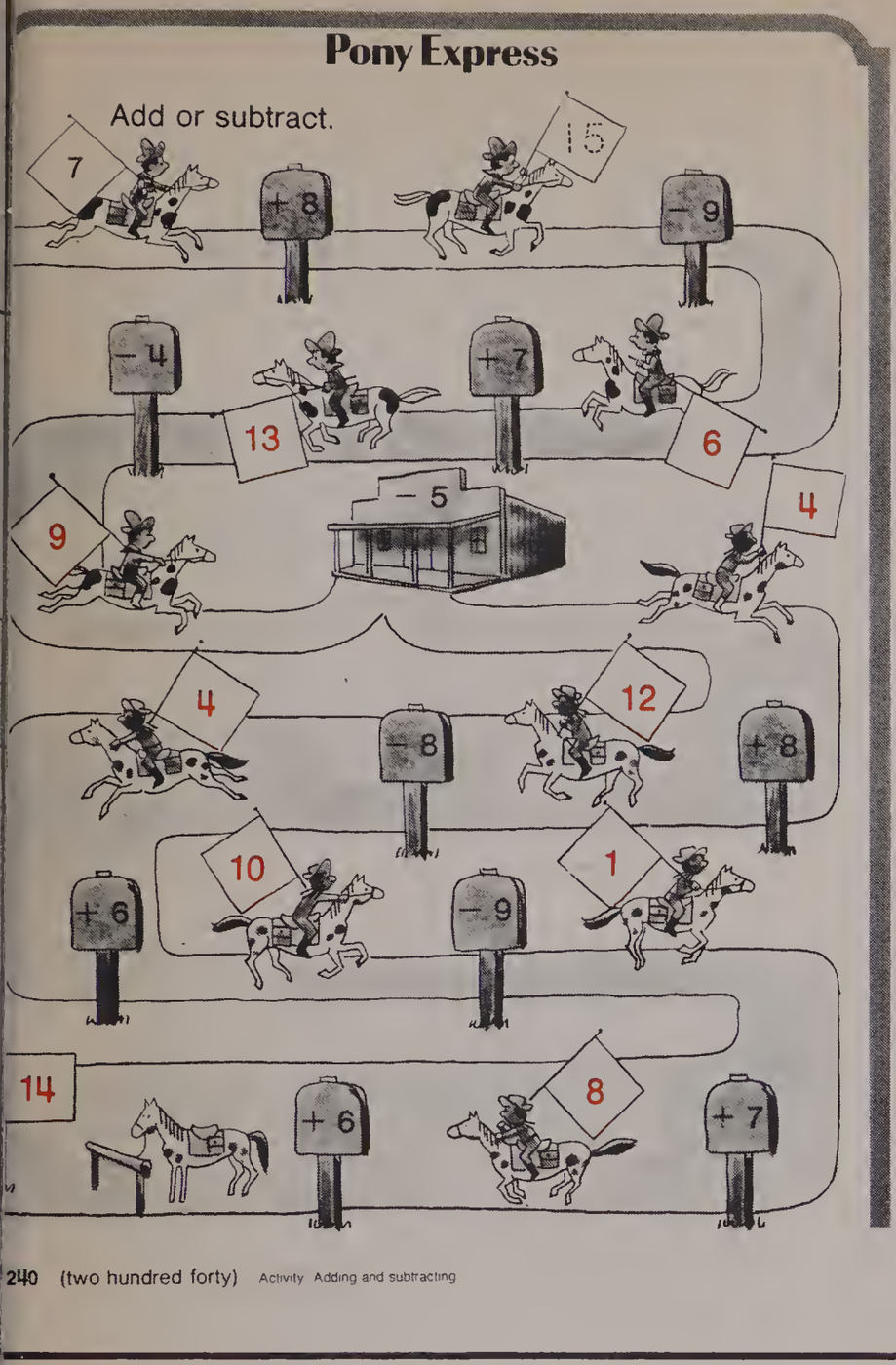
Using the Book This is an activity page. Look at the picture on the top of the page. Ask, "Into how many parts is the circle divided? (10) How many parts are colored?" (3) Explain that we can write 3 out of 10 as 0.3 and we read it 'three tenths'.

Panel 1: Ask the child to count the number of blocks. (10) Then have the child find the decimal numeral indicating how much of the rectangle to color. (0.2) Ask, "How do we read 0.2? (two tenths) What does two tenths mean? (2 parts out of 10) Color 2 of the parts."

Panels 2-7: Adapt the procedure of panel 1.

RELATED AIDS

ACT. MASTERS—17.



240 (two hundred forty) Activity Adding and subtracting

Using the Book This is an activity page. Explain to the child that a long time ago, the mail was carried across part of North America on horseback. This way of carrying the mail was called the Pony Express. Call attention to the horse and rider in the upper left-hand corner of the page. Have the child point to the first 7. Tell the child, "The 7 means the rider has 7 letters in the mailbag." Have the child point to the next numeral, 8. "On the mailboxes there are numbers. +8 means the rider picked up 8 letters at that box, so now he has 8 more. How many has he now? (15) Trace the dashed numeral on the flag. Point to the −9. This means the rider left 9 letters in the box, so now he has 9 less. How many has he now? (6)" Tell the child to write the numeral on each flag to show how many letters are in the mailbag after picking up or leaving letters at the previous mail box.

OBJECTIVES

To practice basic addition and subtraction facts

PACING

Level A (Initial Activities only)
Level B (Initial Activities only)
Level C All

SUGGESTIONS

Initial Activities 1. Conduct a drill on the addition and subtraction facts, sums 18 and less. Write:

$$3 + 9 - 5 - 4 + 6 + 8 = ___$$
$$15 - 7 + 6 - 5 + 9 - 8 = ___$$

Assist the child in finding each answer.

2. You may wish to tell the child something about the Pony Express that carried the mail cross-country in the 19th century.

ACTIVITIES

1. Duplicate a worksheet with exercises similar to those in the Initial Activities. Have the child find the answers.

2. Use Item 2 of the Number Puzzles in the Activity Reservoir.

3. Provide oral practice on the basic addition and subtraction facts.

4. Challenge the child with this problem: "The sum of Ann's age and Bob's age is 15. Ann is 3 years older than Bob. How old is each child? (Ann, 9; Bob, 6)" Blocks might help the child. After experimenting with 15 blocks, the result should look like this:

(Bob)

(Ann)

Give the child this hint: 'Take away 3 blocks for the difference in their ages. Then separate the remaining blocks equally between Ann's age and Bob's age. Then add the 3 blocks to Ann's age, since she is the oldest."

OBJECTIVE

To identify $\frac{1}{2}$, $\frac{1}{3}$, or $\frac{1}{4}$ of a set and ring the appropriate numeral

PACING

Level A (Initial Activities only)
Level B (Initial Activities only)
Level C All (1 guided)

MATERIALS

12 blocks

SUGGESTIONS

Initial Activities 1. Show a set of 8 blocks. Have the child count the blocks and separate the set into halves. Ask, "How many parts are there? (2) How many blocks in each part? (4) Is the set separated into halves? (yes)" Explain that (a) there are 2 equal parts, and (b) each part has an equal number of members; so, the set is separated into halves. Write $\frac{1}{2}$. Touch each part separately. Say, "This part is one half of the set."

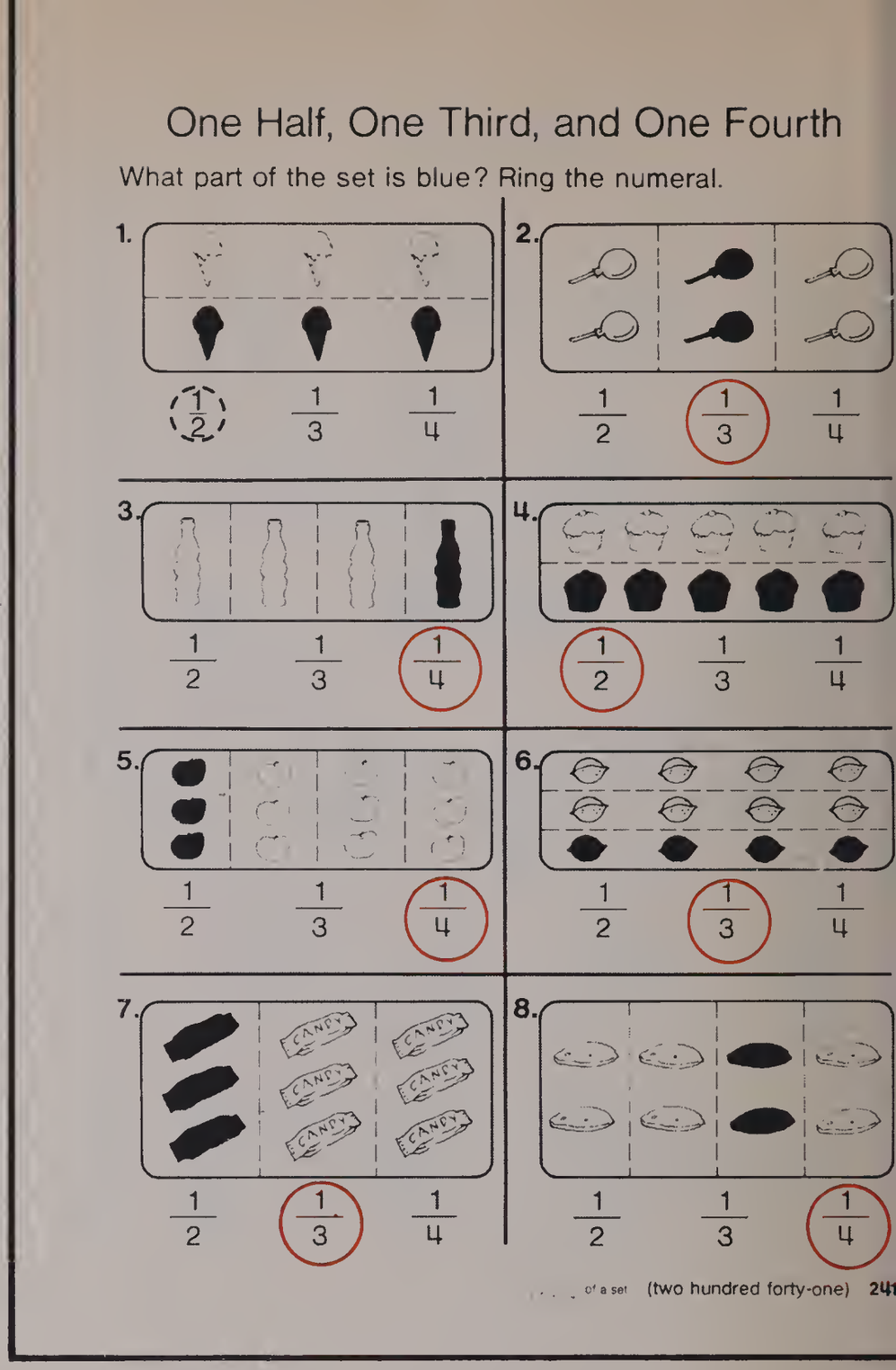
2. Adapt the above activity to develop the concepts of one third and one fourth of a set of 12 blocks.

ACTIVITIES

1. Have the child cut out pictures of objects that can be separated into halves, or thirds, or fourths.

2. Let 3 children work together. Give each child 9 different objects to be separated into thirds. Then each child is to keep $\frac{1}{3}$ and give $\frac{1}{3}$ to each of the 2 other children.

3. Refer to Panels 1 and 4. Provide blocks and have the child illustrate $\frac{1}{2}$ of 6 and $\frac{1}{2}$ of 10. Ask, "One half of 6 is what number? (3) One half of 10 is what number? (5)"

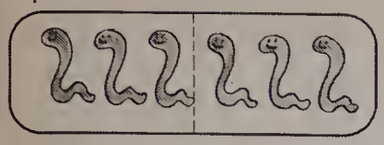


Using the Book Panel 1: Ask, "How many parts is the set separated into by the dashed marks? (2) Is the same number of members in each part? (yes) Is the set separated into halves, thirds, or fourths? (halves) What part is coloured blue? (one half)" Have the child trace the ring around $\frac{1}{2}$.

Panels 2-8: Tell the child, "In each picture, one part of the picture is coloured blue. Ring the numeral that tells the part of the picture that is blue."

Part of a Set

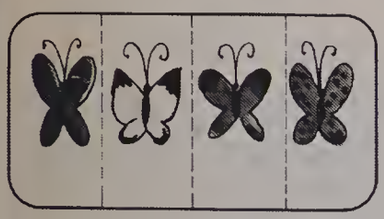
Complete.

1. 

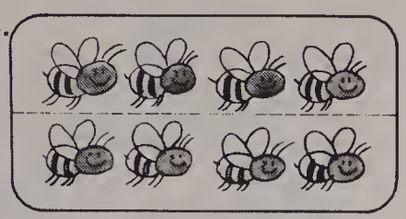
$\frac{1}{2}$ of 6 = ___

2.

$\frac{1}{3}$ of 6 = 2

3. 

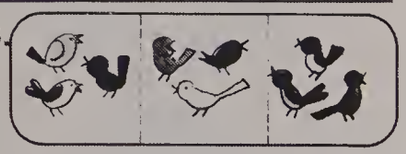
$\frac{1}{4}$ of 4 = 1

4. 

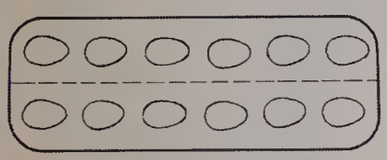
$\frac{1}{2}$ of 8 = 4

5.

$\frac{1}{2}$ of 10 = 5

6. 

$\frac{1}{3}$ of 9 = 3

7. 

$\frac{1}{2}$ of 12 = 6

8.

$\frac{1}{4}$ of 8 = 2

Using the Book Panel 1: Ask, "How many worms in all? (6) Into how many parts is the set separated? (2) Do the parts have the same number of members? (yes) How many worms in each half? (3) Is each part one half of the whole set? (yes) One half of 6 is equal to what number? (3)" Have the child trace the 3 in the blank and read the sentence.

Panel 2: Adapt the procedures in panel 1.

Panels 3-6: Tell the child to complete each number sentence. You may have the child use the pictures to help find the answers or to check the answers.

Panel 7: Have the child describe the objects in the picture. (eggs) Ask, "How many eggs in all? (12) Into how many parts is the set separated? (2) Do the parts have the same number of members? (yes) How many eggs in each half? (6) One half of 12 is equal to what number? (6)" Have the child write 6 in the blank. Explain that 12 eggs is equal to 1 dozen eggs and that 6 eggs is one half dozen eggs.

For panel 8, ask, "How many flowers in all? (8)" Ask, "One quarter of 8 is equal to what number? (2). Have the child write 2.

OBJECTIVES

To find $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$ of numbers

To identify a dozen objects

PACING

Level A (Initial Activities only)
Level B (Initial Activities only)
Level C All (1-2 guided)

MATERIALS

12 blocks

SUGGESTIONS

Initial Activities 1. Give the child a set of 6 blocks. Ask, "How many blocks are in the set? (6)" Have the child separate the set into halves. Ask, "How many blocks in all? (6) Is the set separated into halves? (yes)" Tell the child to touch one half of the set. Ask, "How many blocks are in one half of the set of 6 blocks? (3) One half of 6 is equal to what number? (3)" Write:

$\frac{1}{2}$ of 6 = ___

Have the child complete the sentence.

2. Repeat the activity above for:

$\frac{1}{3}$ of 6 = 2 $\frac{1}{3}$ of 12 = 4

$\frac{1}{4}$ of 4 = 1 $\frac{1}{4}$ of 12 = 3

3. Introduce a dozen as 12 things.

RELATED AIDS

BFA COMP LAB I—72.

OBJECTIVE

To find missing factors

PACING

Level A	(Initial Activities only)
Level B	(Initial Activities only)
Level C	All (1-2 guided)

VOCABULARY

missing factor

MATERIALS

5 empty boxes, 20 blocks

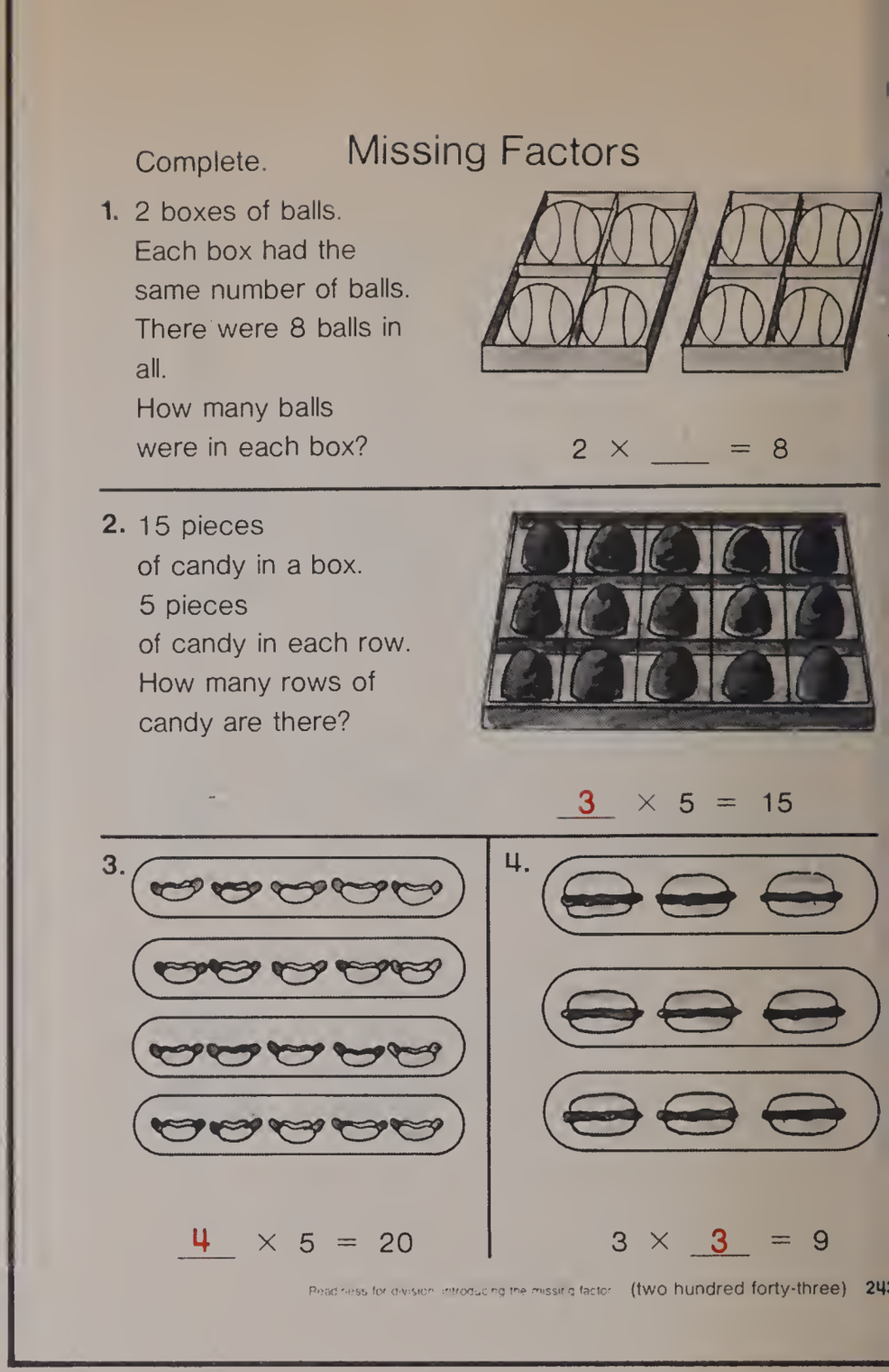
SUGGESTIONS

Initial Activities 1. Display 2 boxes with 3 blocks in each box. Ask, "How many boxes? (2) How many blocks in each box? (3) How many blocks in all? (6)" Guide the child in writing $2 \times 3 = 6$.

Display 3 boxes with 4 blocks in each box, but do not let the child see the blocks. Ask, "How many boxes are there?" Explain to the child that the boxes have the same number of blocks and there are 12 blocks in all. Ask, "How many blocks in each box? (4)" Write $3 \times __ = 12$. Relate the sentence to the situation. Ask, "Is the product missing or is a factor missing? (factor)" Tell the child the missing number may be called a missing factor. Ask, "3 times what number is equal to 12? (4)" Have the child write 4 in the frame. Show the child the 4 blocks in each box to verify the answer.

2. Tell this story: "Bob has 10 birds. He wants to put 2 birds in each cage. How many cages does he need?" Dramatize the story using 10 blocks to represent 10 birds. Write $__ \times 2 = 10$. Relate the sentence to the story. Explain that the number of cages times 2 is equal to 10.

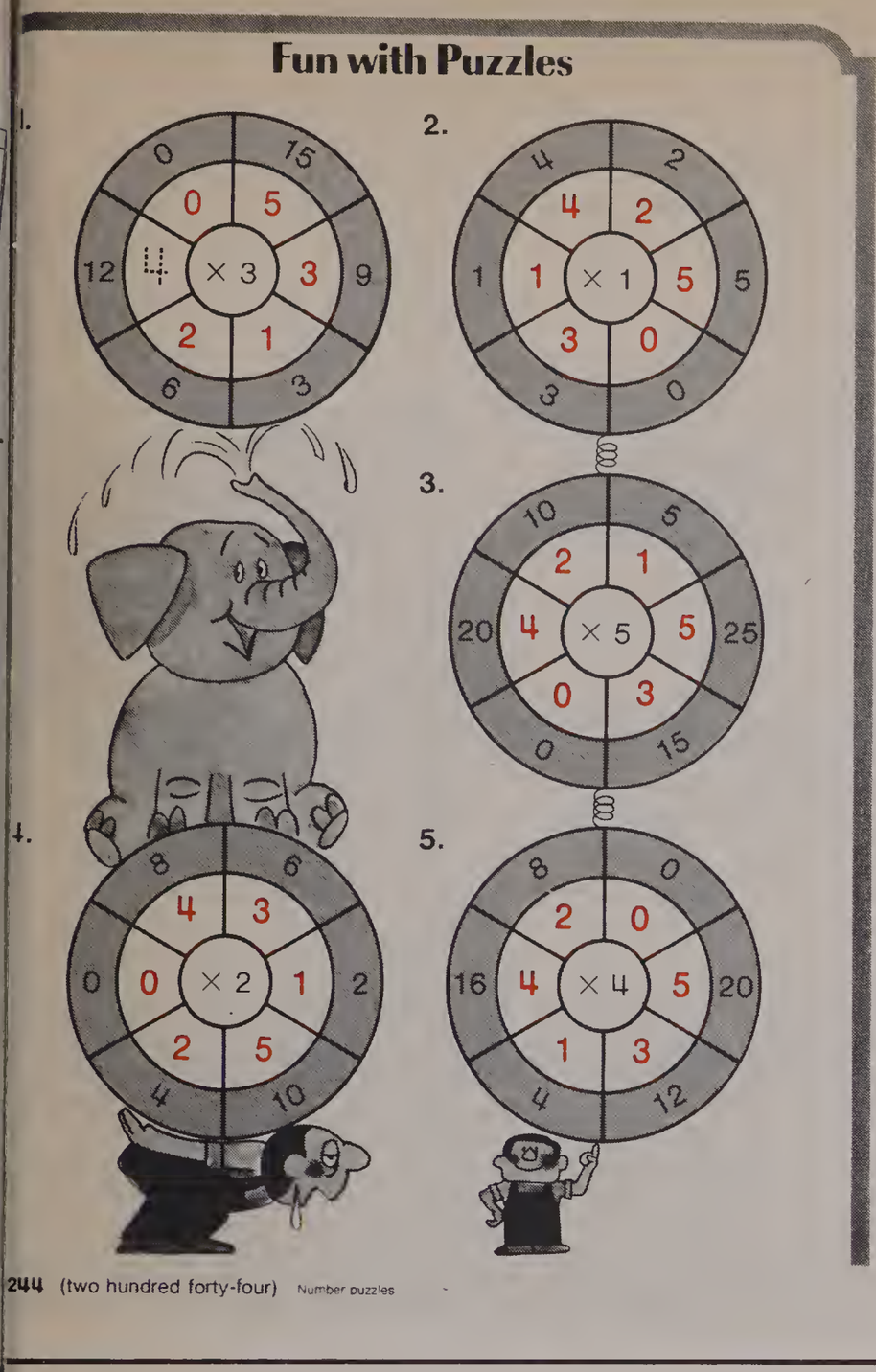
Show 7 empty boxes. Tell the child to pretend that each box is a bird cage and that blocks are birds. Ask the child to put 2 blocks in each cage until the 10 blocks are all used. Ask, "How many boxes did you use? (5) How many cages does Bob need? (5) What is the missing factor in $__ \times 2 = 10$? (5)"



Using the Book Panel 1: Assist the child in reading the problem. Call attention to the multiplication sentence. Ask, "Is the missing number a factor or the product? (factor) What does the 2 refer to in the problem? (the number of boxes) What does the missing factor refer to in the problem? (the number of balls in each box) What does the 8 refer to in the problem? (the number of balls in all) Two times what number equals 8? (4) What is the missing factor? (4)" Have the child trace 4 in the blank.

Panel 2: Adapt the procedures for panel 1.

Panels 3-4: Tell the child to find the missing factor in each multiplication sentence.



Using the Book This is an activity page. Tell the child that each picture shows a multiplication puzzle. Say, "Products are named in the purple parts (or rim). One factor is named at the yellow center." For each product, the child is to find the missing factor and write it on the white part of the puzzle.

Panel 1: Ask, "What is the factor in this puzzle? (3) What are the products in this puzzle? (reading counterclockwise: 0, 12, 6, 3, 9, 15)" Have the child touch the product 12 and the factor 3. Ask, "The product is 12, one factor is 3, what is the other factor?" Say, "Three times what number is 12? (4)" Have the child trace 4 in the white ring. Continue in this manner until all the missing factors in the puzzle are found.

Panels 2-5: Tell the child to find the missing factors.

OBJECTIVE

To find missing factors

PACING

Level A (Initial Activities only)
Level B (Initial Activities only)
Level C All (1 guided)

MATERIALS

number puzzles similar to those on page 244

SUGGESTIONS

Initial Activity Draw a puzzle similar to those on page 244. Explain that the products are named in the outer part. One factor is given at the center. Challenge the child to find the other factor and write it in the space between the product and the factor given in the center. (See Using the Book, page 244, for teaching procedure.)

ACTIVITIES

1. Provide oral multiplication practice by using the game Stop the Magician.

2. Adapt the game Pop Up for multiplication facts products 15 and less. Distribute numeral cards 0-15. Read combinations such as 2 × 5, etc.

3. Give the child word puzzles:

How many days in 3 weeks?
How many days in 3 school weeks?
How many cents are 4 nickels worth?
How many cents are 3 dimes worth?
How many shoes in 4 pairs of shoes?

For each word puzzle, the child writes a multiplication sentence to go with the puzzle and then solves the puzzle.

OBJECTIVES

To divide numbers 18 and less by 2
To use the ÷ sign for division

PACING

Level A (Initial activities only)
Level B (Initial activities only)
Level C All (1-2 guided)

VOCABULARY

division, divided by, remainder

MATERIALS

12 blocks, 2 containers, 2 paper cups, beads, popsicle sticks

SUGGESTIONS

Initial Activities 1. Display a set of 12 blocks and 2 containers. Have the child put the blocks in the containers, one at a time, alternating containers each time. Ask, "How many blocks to start with? How many containers? How many blocks are there in each container?" Write: 12 ÷ 2 = ___. Relate the sentence to the situation. Tell the child the sharing (separating) process is called division and that the short way to write "divided by" is to use the sign ÷.

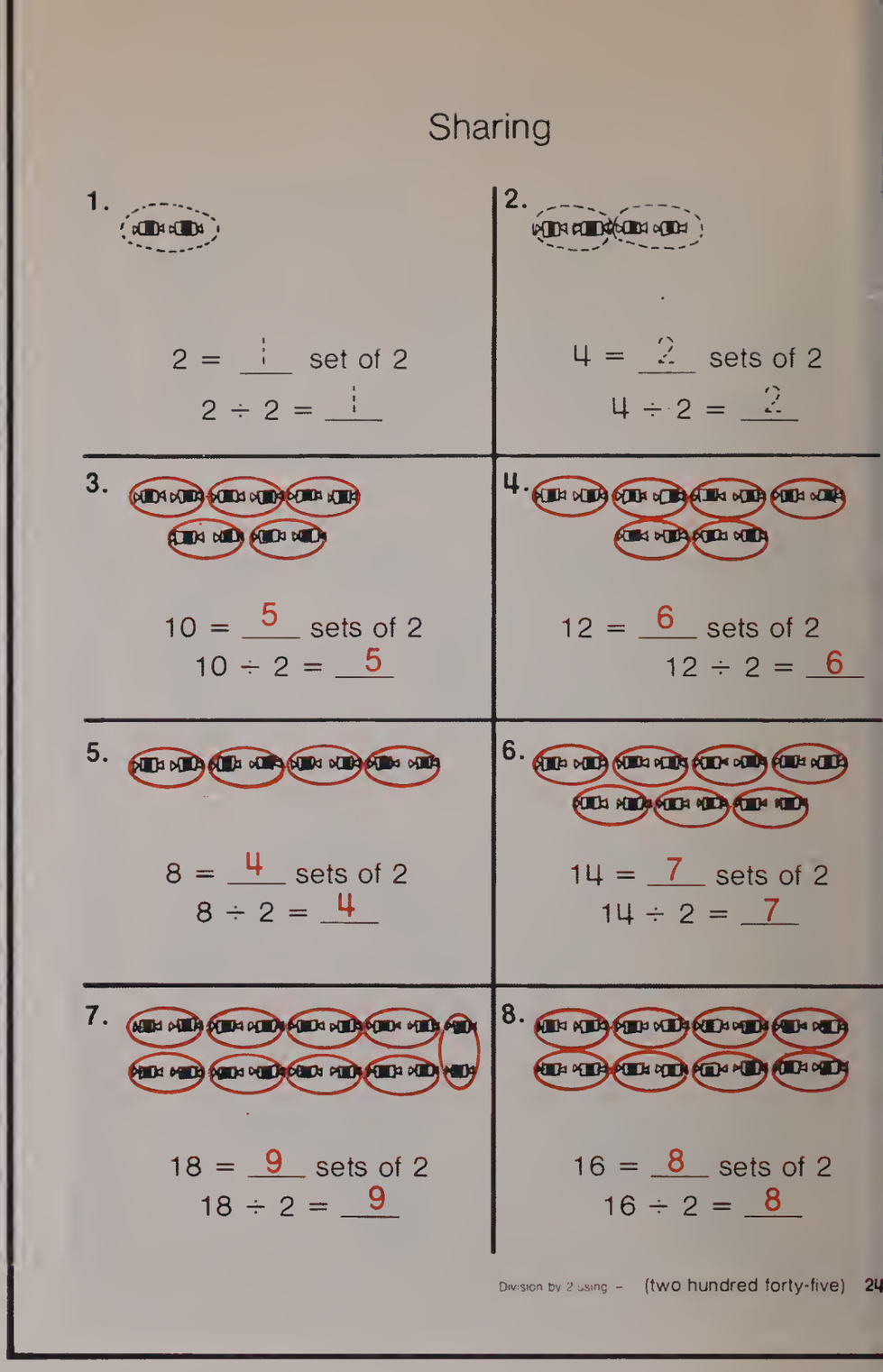
2. Tell this story. Sarah has 10 bits of cheese to feed her 2 pet mice. She wants each mouse to get the same number of pieces. How many bits of cheese should she give each mouse? Dramatize the story using 10 orange blocks to represent the cheese, one student to be Sarah and two other students to be mice. Let Sarah give the mice one piece of cheese at a time, alternating mice for each piece given. Write: 10 ÷ 2 = ___. Relate the sentence to the story. Explain that the number of pieces of cheese (10) divided by the number of mice (2) is equal to the number of pieces of cheese each mouse gets.

ACTIVITIES

1. Give the child a set of blocks. Have the child count out 14 beads. Say, "Put the beads in groups of two's. How many groups of 2 can you make?" Write 14 ÷ 2 = 7. Relate the sentence to the activity.

2. Have the children sit in a circle. Give one child 10 popsicle sticks. Have the child give the first person in the circle 2 sticks; then give the second person 2 sticks and so on until all the sticks have been given out. Then have the child count the number of people that received 2 sticks. Write: 10 ÷ 2 = 5. Relate the sentence to the activity.

3. Give the child 9 popsicle sticks. Have the child put the sticks in piles of 2. Ask, "How many piles of 2 did you make? (4) Did you have any sticks over?" (yes) Explain that leftovers are called remainders.



Using the Book Panel 1: Explain that we want to put the candies in groups of two. Say, "Trace the line around the 2 candies. How many groups of 2 can we make from the 2 candies." (1) Have the student trace the 1 and explain that the 2 candies can be put in 1 group of 2 and then all the candies have been used. Explain the sign ÷ means division. Read the sentence 2 ÷ 2 = 1 and relate the sentence to the activity.

Panel 2: Adapt the procedure from panel 1.

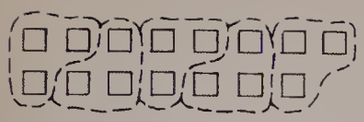
Panels 3-8: Ask the students to draw a line around 2 candies. Then draw another line around 2 more candies. Do this until all the candies have been used. Have the child fill in the blanks by counting the groups of 2 that have been circled. Relate the grouping to division by 2.

RELATED AIDS

ACT. MASTERS—57.
BFA COMP LAB I—110.

Dividing

1.



15 = 5 sets of 3
15 ÷ 3 = 5

2.

18 = 6 sets of 3
18 ÷ 3 = 6

3.

12 = 2 sets of 6
12 ÷ 6 = 2

4.

12 = 3 sets of 4
12 ÷ 4 = 3

5.

9 = 9 sets of 1
9 ÷ 1 = 9

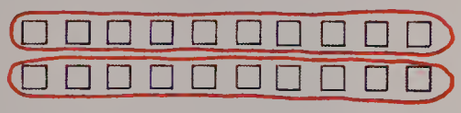
6.

14 = 2 sets of 7
14 ÷ 7 = 2

7.

16 = 2 sets of 8
16 ÷ 8 = 2

8.



20 = 2 sets of 10
20 ÷ 10 = 2

Using the Book Panel 1: Ask, "How many blocks are there altogether?" (15) Explain that we want to group the blocks in sets of threes. Say, "Trace the line around each set of 3 blocks." Ask, "How many sets of 3 blocks are there?" (5) Have the child fill in the blanks. Relate the sentences to the problem.

Panel 2: Ask, "How many blocks altogether? (18) How many blocks do we want in each set?" (3) Say, "Draw a line around each different group of 3 that you can find." Ask, "How many sets of 3 blocks did you find?" (6) Have the child fill in the blanks. Relate the sentences to the problem.

Panels 3-8: Tell the child to group the blocks in groups as indicated and then fill in the blanks.

RELATED AIDS

ACT. MASTERS—57.
BFA COMP LAB I—110.

OBJECTIVE

To find quotient, dividends 20 or less

PACING

Level A (Initial activities only)
Level B (Initial activities only)
Level C All (1-2 guided)

VOCABULARY

quotient, dividend

MATERIALS

pennies, blocks, beads

SUGGESTIONS

Initial Activity Give the child 20 pennies (or some other object). Have the child put the pennies in piles of 5 coins each. Ask, "How many pennies to start with? (20) How many piles of 5 coins?" (4) Write 20 ÷ 5 = 4. Relate the sentence to the activity. If children are ready, relate the number of coins to their monetary value.

ACTIVITIES

1. Give the child a set of blocks. Have the child count out 15 blocks. Say, "Put the blocks into groups of 5 each until you have used all 15 blocks." Ask, "How many groups of 5 did you make?" (3) Write 15 ÷ 5 = 3. Relate the sentence to the activity.

2. Adapt the game Zip Up described in the Activity Reservoir. Use numbers that divide three or four times (18 by 2, 20 by 2, 16 by 2). Let children use blocks if necessary.

3. Give the child 14 beads. Have the child put the beads into piles of 4 beads. Ask, "How many piles of 4 beads did you make? (3) Did you have any beads left over?" (yes) Explain that leftovers are called remainders.

EXTRA PRACTICE

Tell the child to divide. Use concrete objects to group.

1. 14 ÷ 2 = 18 ÷ 9 = 9 ÷ 3 =
   12 ÷ 3 =
2. 16 ÷ 4 = 20 ÷ 4 = 13 ÷ 13=
   7 ÷ 1 =

OBJECTIVE

To evaluate achievement of the Chapter Objectives

PACING

Level A	Omit
Level B	Omit
Level C	All

SUGGESTIONS

The Chapter Test is designed to be used in a diagnostic manner. It assesses the child's knowledge of the main concepts and skills that were taught in this chapter. Some children should take this test independently with guidance for instructions only. Use judgement as to whether certain children should be guided through some or all of the exercises. Check each child's work and mark the items that are incorrect. Reteaching or extra practice might be necessary to help the child acquire the concept or skill that was missed. With this reteaching, you will be able to ascertain whether the child has then learned the topic in question. See Using the Book for page references indicating where the concept or skill was taught.

ACTIVITIES

1. Play the game Bingo described in the Activity Reservoir. Include addition and subtraction facts through sum 18.

2. Have a relay game for practicing basic addition and subtraction facts through sum 18. Use the Basic Fact Practice Cards game described in the Activity Reservoir.

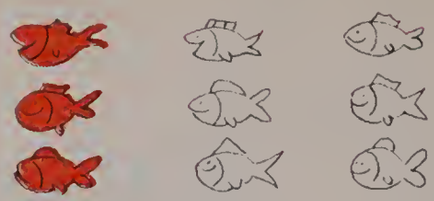
3. Play the game Concentration described in the Activity Reservoir. Include money, fractions, time, and multiplication in the cells.

THINK!

1.

Colour $\frac{1}{2}$ of the set.

$\frac{1}{2}$ of 6 = 3

2. 

Colour $\frac{1}{3}$ of the set.

$\frac{1}{3}$ of 9 = 3

3. Complete.

$2 \times 4 = 8$ $\quad 3 \times 0 = 0$ $\quad 1 \times 1 = 1$

$5 \times 1 = 5$ $\quad 5 \times 2 = 10$ $\quad 3 \times 3 = 9$

4. Complete.

$4 \times 1 = 4$ $\quad 5 \times 0 = 0$ $\quad 3 \times 2 = 6$

$4 \times 4 = 16$ $\quad 4 \times 2 = 8$ $\quad 5 \times 5 = 25$

5. Complete.

12 = 3 sets of 4

12 ÷ 4 = 3

10 = 5 sets of 2

10 ÷ 2 = 5

Using the Book This is a diagnostic test. The page references are given for reteaching as needed. The letter indicates the objective.

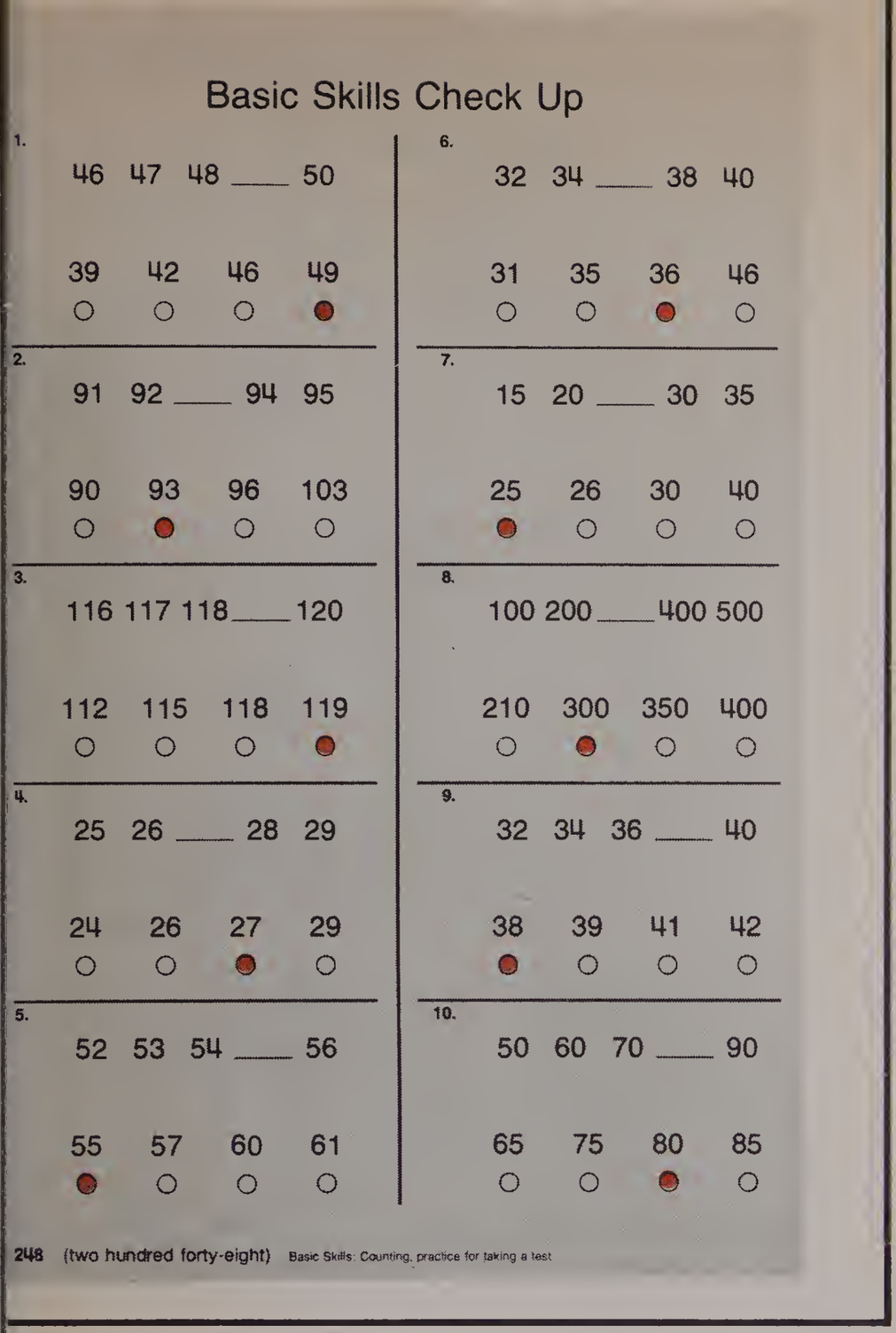
Panel 1: Have the child color one half of the set. Then have the child complete the number sentence. [pages 241-242 C, D]

Panel 2: Have the child color one third of the set. Then have the child complete the number sentence. [pages 241-242 C, D]

Panel 3: Tell the child to write the products. [page 231 A]

Panel 4: Have the child write the missing number in each sentence to make a true sentence. [pages 243-244 B]

Panel 5: Have the child write the missing number in each sentence to make a true sentence. [pages 245-246 E]



Using the Book Panel 1: Direct the child to the number pattern. Tell the child, "We are going to count by ones." Read, "46, 47, 48." Ask, "What number comes next? (49) Does 49 come after 48? (yes)" Make sure that each child verifies that 49 is the missing number. Say, "Look at the circle below 49. The circle that goes with the number 49 is filled in to show that this is the answer. Have the child darken the circle over the grey screen.

Panels 2-5: Have the child count by ones to find the missing number, and fill in the correct circle. Make sure the child understands how to indicate the answer correctly.

Panels 6 and 9: Have the child count by 2's to find the missing number.

Panel 7: Have the child count by 5's to find the missing number.

Panel 8: Have the child count by 100's to find the missing number.

Panel 10: Have the child count by 10's to find the missing number.

OBJECTIVE

To count by 1's, 2's, 5's, 10's, 100's

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

The purpose of this page is to provide experience in the type of format that may be used on standardized tests, and so is an optional lesson. Some children may do this page independently with guidance for instructions only. Use judgement as to whether certain children should be guided through some or all of the exercises. On standardized tests at this grade level, all directions are oral. The "Using the Book" section gives guidance for administering this page. Notice that the circles for answers are all arranged horizontally on these pages to give practice with this format. In filling in the circles make sure that the child presses down with the pencil to make a dark mark. Do not be concerned if the child does not fill in the circles exactly.

This page may be used in a diagnostic manner. Reteaching or extra practice may be necessary for those children who have difficulty with a particular skill. The chart below shows the page number where the skill was taught.

Skill	Page
counting by 1's	53, 119
counting by 5's	123, 59
counting by 2's	60
counting by 10's	124, 47
counting by 100's	115

OBJECTIVE

To add to sum 18

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

The purpose of this page is to provide experience in the type of format that may be used on standardized tests, and so is an optional lesson. Some children may do this page independently with guidance for instructions only. Use judgement as to whether certain children should be guided through some or all of the exercises. On standardized tests at this grade level, all directions are oral. The "Using the Book" section gives guidance for administering this page. Notice that the circles for answers are all arranged horizontally on these pages to give practice with this format. In filling in the circles make sure that the child presses down with the pencil to make a dark mark. Do not be concerned if the child does not fill in the circles exactly.

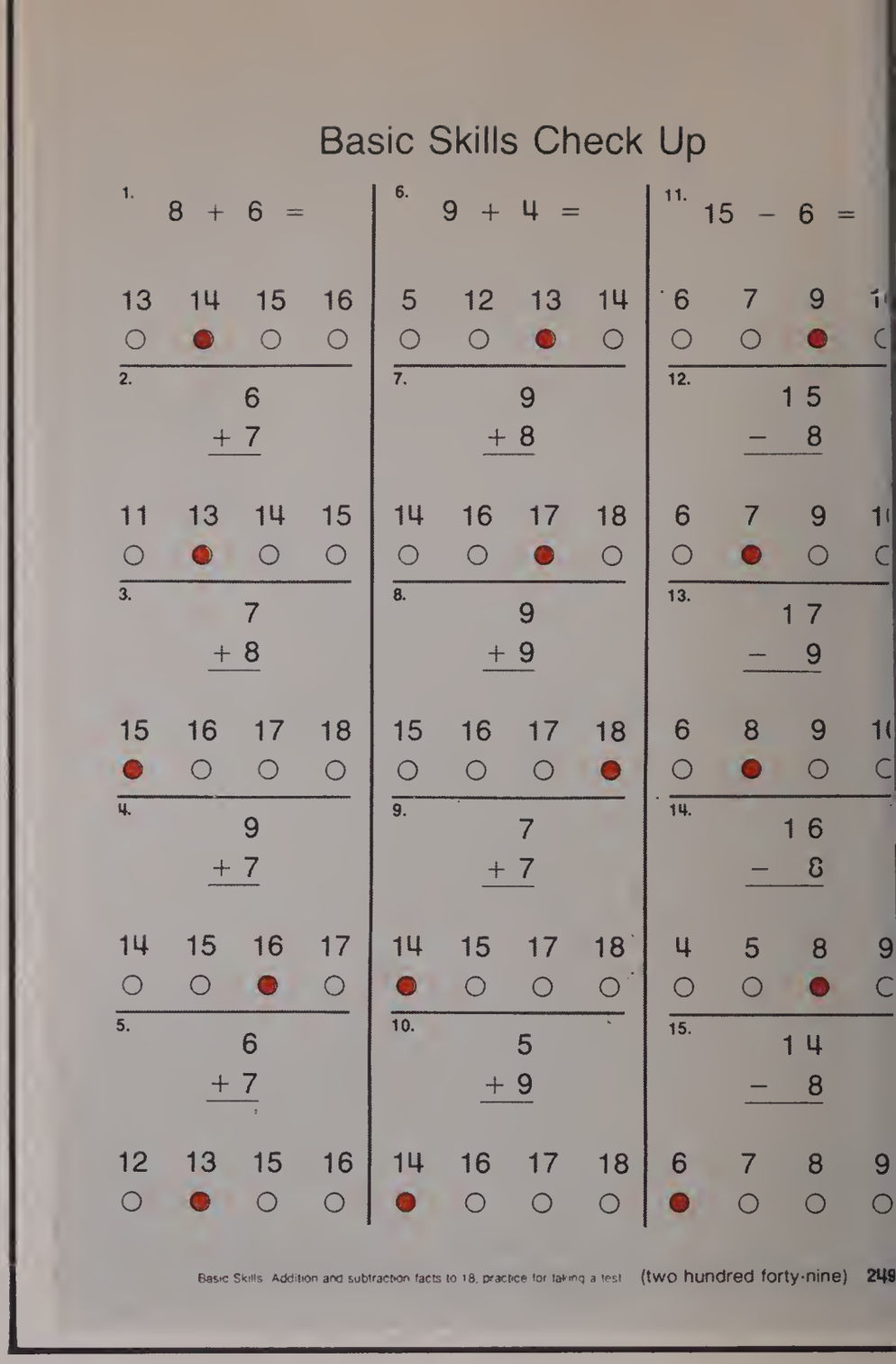
This page may be used in a diagnostic manner. Reteaching or extra practice may be necessary for those children who have difficulty with a particular skill. The chart below shows the page number where the skill was taught.

Skill	Page
sums 13 and 14	139
sums 15 and 16	168
sums 17 and 18	169

ACTIVITIES

1. Have the child play Basic Fact Wheels as described in the Activity Reservoir, using addition facts to 18.

2. Have the child play Bingo as described in the Activity Reservoir.



Using the Book Panel 1: Direct the child to 8 plus 6. Ask, "8 plus 6 equals what number?" (14) Tell the child to look at the numbers below the example. Have the child find the number 14. Say, "Look at the circle below the 14. The circle that goes with the number 14 is filled in to show that this is the answer, 8 plus 6 equals 14." Have the child darken the circle over the grey screen.

Panel 2: Have the child add and fill in the correct circle to show the number." (13) Tell the child to look at the numbers below the example. Have the child find the number 13. Say, "Fill in the circle below the number 13 to show your answer. Six plus 7 equals 13."

Panels 3-15: Have the child add or subtract and fill in the correct circle to show the answer. Make sure the child understands how to indicate the answer correctly. Then the child can proceed alone to finish the page. Some children may want to work out the answers on a separate sheet of paper.

Basic Skills Check Up

1. How much in all?

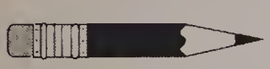
21¢ ○ 31¢ ● 36¢ ○ 27¢ ○

2. 13¢ - 7¢ 4¢ ○ 5¢ ○ 6¢ ● 7¢ ○

3. A pen cost 17¢
A pencil cost 4¢
How much in all? 19¢ ○ 20¢ ○ 21¢ ● 25¢ ○

4. 18 dishes.
6 break.
How many are left?
10 ○
12 ●
13 ○
14 ○

5. Use your ruler.



3 cm ○ 4 cm ○ 5 cm ● 6 cm ○

6.

3:00 ○ 3:30 ● 6:15 ○ 6:30 ○

Using the Book Panel 1: Direct the child to the coins. Say, "There is a quarter, a nickel and a penny. How much money is there in all?" Point out to the child, the numbers below the coins. Say, "Fill in the circle that tells the amount of money."

Panel 2: Say, "How much is 13 cents minus 7 cents?" Have the child fill in the circle that correctly answers the question.

Panels 3-4: Read the problems to the child. Have the child fill in the circle that indicates the correct answer to the problems.

Panel 5: Say, "Use your ruler to find the length of the pencil in centimetres." Have the child fill in the correct circle.

Panel 6: Say, "What time does the clock face show?" Have the child indicate the correct answer by filling in the circle indicating the correct time.

OBJECTIVES

To know the value of coins
To solve mini-problems
To measure in centimetres
To tell time to half hour

PACING

Level A	All
Level B	All
Level C	All

SUGGESTIONS

The purpose of this page is to provide experience in the type of format that may be used on standardized tests, and so is an optional lesson. Some children may do this page independently with guidance for instructions only. Use judgement as to whether certain children should be guided through some or all of the exercises. On standardized tests at this grade level, all directions are oral. The "Using the Book" section gives guidance for administering this page. Notice that the circles for answers are all arranged horizontally on these pages to give practice with this format. In filling in the circles make sure that the child presses down with the pencil to make a dark mark. Do not be concerned if the child does not fill in the circles exactly.

This page may be used in a diagnostic manner. Reteaching or extra practice may be necessary for those children who have difficulty with a particular skill. The chart below shows the page number where the skill was taught.

Skill	Page
value of coins	129
money problems	148
problem solving	90
centimetres	197
time to half hour	67

ACTIVITIES

1. Set up a play store. Label pictures of various items (bananas, milk, toys) with prices. Have the children use play money to buy the various items. Children should alternate being the cashier to gain practice making change.

2. Have children make as many different sets of coins as possible that make change for one dollar, fifty cents or twenty-five cents.

1. Add. (71)

4	2	0	2	2	1
+ 5	+ 4	+ 3	+ 7	+ 3	+ 6
9	6	3	9	5	7
8	2	6	6	7	4
+ 1	+ 5	+ 1	+ 3	+ 0	+ 3
9	7	7	9	7	7
5	3	2	2	5	0
+ 1	+ 4	+ 1	+ 6	+ 2	+ 0
6	7	3	8	7	0

2. Subtract. (76)

9	5	9	6	7	5
- 5	- 3	- 4	- 4	- 6	- 4
4	2	5	2	1	1
6	7	5	3	6	8
- 3	- 5	- 2	- 0	- 5	- 5
3	2	3	3	1	3
7	4	9	0		
- 3	- 4	- 7	- 0		
4	0	2	0		

1. Add. (97)

24	62	81	63	70
+ 23	+ 36	+ 18	+ 24	+ 25
47	98	99	87	95
80	29	42	88	74
+ 12	+ 30	+ 34	+ 11	+ 15
92	59	76	99	89
66	51	12	50	
+ 33	+ 26	+ 86	+ 30	
99	77	98	80	

2. Subtract. (102)

83	69	56	70	44
- 12	- 25	- 30	- 40	- 21
71	44	26	30	23
36	55	86	58	65
- 11	- 42	- 13	- 31	- 14
25	13	73	27	51
53	77	65	96	
- 41	- 22	- 10	- 46	
12	55	55	50	

1. Add. (105)

2	6	3
+ 8	+ 4	+ 7
10	10	10
5	1	8
+ 5	+ 9	+ 2
10	10	10
7	4	9
+ 3	+ 6	+ 1
10	10	10

2. Subtract. (107)

10	10	10
− 5	− 3	− 1
5	7	9
10	10	10
− 4	− 6	− 8
6	4	2
10	10	
− 7	− 2	
3	8	

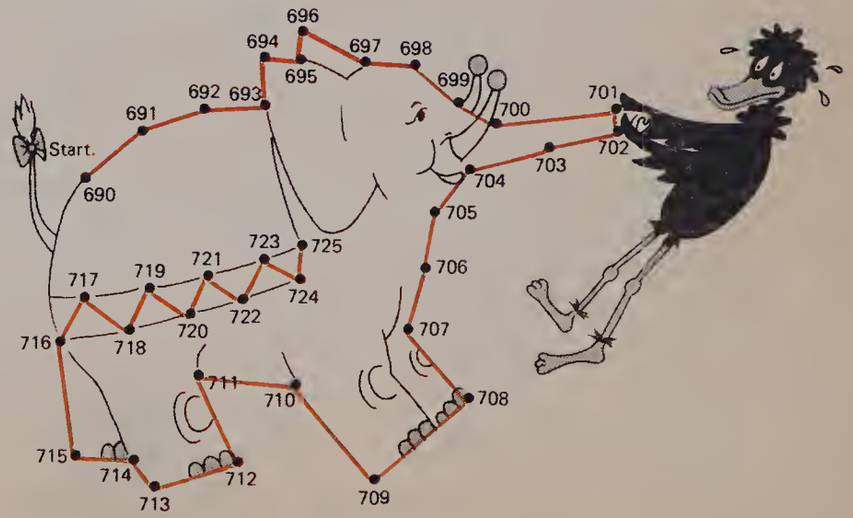
3. Add. (135)

4	3	6	8	2
4	2	3	1	1
+ 1	+ 4	+ 1	+ 1	+ 3
9	9	10	10	6
3	2	3	7	4
4	6	1	2	1
+ 3	+ 2	+ 4	+ 1	+ 3
10	10	8	10	8
3	1	2	1	
3	1	5	3	
+ 2	+ 2	+ 1	+ 6	
8	4	8	10	

1. Write the missing numerals. (120)

610	620	630	640	650	660	670	680
250	255	260	265	270	275	280	285
396	397	398	399	400	401	402	403
800	805	810	815	820	825	830	835
504	506	508	510	512	514	516	518
696	697	698	699	700	701	702	703

2. Connect the dots.



1. Add. (213)

46 + 7 = 53	72 + 8 = 80	29 + 6 = 35	65 + 5 = 70	28 + 6 = 34
48 + 48 = 96	14 + 17 = 31	17 + 39 = 56	75 + 15 = 90	36 + 45 = 81
21 + 59 = 80	56 + 35 = 91	32 + 49 = 81	47 + 29 = 76	

2. Subtract. (220)

42 − 8 = 34	71 − 6 = 65	53 − 9 = 44	76 − 7 = 69	88 − 9 = 79
83 − 56 = 27	70 − 38 = 32	33 − 17 = 16	82 − 69 = 13	95 − 36 = 59
75 − 29 = 46	94 − 26 = 68	90 − 67 = 23	67 − 48 = 19	

(227)

1. Add.

4 + 9 = 13	5 + 6 = 11	7 + 8 = 15	3 + 9 = 12	7 + 4 = 11	8 + 9 = 17
6 + 7 = 13	8 + 4 = 12	7 + 9 = 16	2 + 9 = 11	8 + 6 = 14	7 + 5 = 12
9 + 6 = 15	3 + 8 = 11	8 + 5 = 13	9 + 9 = 18	6 + 6 = 12	9 + 5 = 14

2. Subtract.

14 − 7 = 7	12 − 9 = 3	16 − 8 = 8	11 − 3 = 8	11 − 7 = 4	13 − 9 = 4
15 − 8 = 7	12 − 7 = 5	13 − 4 = 9	17 − 9 = 8	11 − 2 = 9	14 − 8 = 6
13 − 7 = 6	17 − 8 = 9	11 − 5 = 6	15 − 9 = 6	12 − 8 = 4	

INDEX

Activity(ies), 3, 4, 19, 21, 22, 39, 41, 54, 59, 60, 73, 74, 89, 115, 123, 124, 138, 172, 193, 199, 200, 203, 204, 212, 240, 244
Addend(s)
order of, 29-30, 139, 168 • three, 135, 168, 208, 253 • zero as, 27-28
Addition
checking, 152 • column, 135, 253 • families, 38, 78-79 • of hundreds, 161 • of hundreds, tens, ones, no regrouping, 162, 163 • of ones to tens and ones, no regrouping, 95 • of ones to tens and ones, regrouping, 95 • of tens, no regrouping, 93 • of tens and ones, no regrouping, 97-98, 252 • of tens and ones, regrouping, 211-216, 255 • related to subtraction, 38, 80, 177, 178 • facts to 7, 25-26, 251 • facts to 8, 69-70, 79-80 • facts to 9, 71-72, 251 • facts to 10, 104-105, 107, 256 • facts to 12, 137-138, 256 • facts to 14, 139-140, 256 • facts to 16, 168 • facts to 18, 169-170, 256 • three addends in, 135, 168, 169, 253
Addition tables, 173
After, 5, 8, 55
Arbitrary units, 196
At Home Activity(ies), 8, 9, 17, 26, 32, 39, 59, 60, 82, 84, 91, 109, 110, 115, 120, 131, 138, 146, 170, 176, 184, 186

Basic Skills Check Up, 44-46, 158-160, 248-249
Before, 5, 8, 55
Between, 56
Box, 188

Calendar, 73
Career(s)
Day care centre workers, 80 • Firefighters, 222 • Forest rangers, 208 • Furniture upholsterers, 134 • Musicians, 147 • Painters, 18 • Pilots and copilots, 171 • Sales workers, 9 • Truck mechanics, 62 • Veterinarians, 111
Centimetre, 197, 200
Chapter Test(s)
Chapter 1, 10 • Chapter 2, 23-24 • Chapter 3, 43 • Chapter 4, 68 • Chapter 5, 92 • Chapter 6, 112 • Chapter 7, 136 • Chapter 8, 157 • Chapter 9, 180 • Chapter 10, 209-210 • Chapter 11, 228 • Chapter 12, 247
Check Up, 110, 227
Circle, 186
Column addition, 135, 139, 253
Comparing
capacity, 201, 203 • lengths, 195 • numbers, 11-16, 57-58, 121-122
Cone, 188
Counting
by twos, 60, • by fives, 59-61 • by tens, 47, 61 • through 199, 118 • through 499, 119 • through 999, 120 • to twenty, 6-7
Cylinder, 188

Degree, 204
Diagnostic Test(s), *See* Check-Up
Dime, 125-126
Dollar, 131

Expanded numeral, 48, 49, 51-52
Extra Practice, 37

Factor(s)
meaning of, 231 • missing, 243 • one as, 234 • order of, 233
Family(ies)
meaning of, 38 • to sum 7, 42 • to sum 9, 78-79 • to sum 14, 145-146
Fraction(s)
as part of a whole, 83-88 • one fourth, 87-88 • one half, 84 • one third, 85-86

Geometric figure(s)
box, 188 • circle, 186 • cylinder, 188 • line, 182 • rectangle, 184 • sphere, 188 • square, 185 • symmetry in, 193 • triangle, 183
Geometry
box, 188 • circle, 186 • cone, 188 • inside, 187 • line segment, 182 • on, 187 • outside, 187 •
Gram, 206
Graph(s)
horizontal bar, 21 • horizontal picture, 19 • reading, 61 • vertical bar, 22, 172 • vertical picture, 20
Greater than, 11, 12, 57

Half litre, 202

Inside, 187

Keeping Fit, 42, 91, 133, 156, 217
Kilogram, 206, 207

Less than, 13, 14, 57
Line segment, 182
Linear measure
arbitrary units, 196 • centimetre, 197-198 • comparing lengths, 195 • metre, 199-200
Liquid measure
comparing capacity, 203 • litre, half litre, quarter litre, 202
Litre, 202, 203

Mass, 205-207
Measurement
metric system, 197-207
Metre, 199-200
Metric system, 197-207
Mini-problem(s), 90, 104, 154, 171, 222, 269
Money
counting, 125-126, 131, 250 • dime, 125 • dollar, 131 • in problem solving, 127, 130, 132, 148 • making change, 226 • nickel, 125 • penny, 125 • quarter, 129
Multiplication
factors in, 231-235 • introducing, 231 • one as a factor in, 234 • product in, 283-284 • readiness for, 229-230 • zero as a factor, 235
Multiplication table, 236

Nickel, 125
Number(s)
cardinal sense of, 5, 8 • comparing, 11-16 • concept of, 1-2 • concept of one hundred, 113 • counting, 3-9, 47, 53, 61, 74, 123, 124, 156 • order of, 5, 8, 48, 137, 139, 168 • ordinal sense of, 17-18
Number family(ies), *See* Family(ies)
Number line, 16
Numeral(s)
expanded, 48, 49, 51-52 • two digit, 51-52 • three digit, 161 • writing 0 through 5, 3 • writing 5 through 9, 4 • writing 0 through 20, 7 • writing 1 through 100, 53 • writing through 999, 118-120

On, 187
Order property
for addition, 29-30, 137, 139 • for multiplication, 233
Ordering numbers, 5, 8, 48, 119-120
Ordinal sense of number, 17-18, 181
Outside, 187

Penny, 125
Picture graphs, 19
Place Value
table(s), 94 • through 99, 57 • through 999, 114-117
Point, 182
Practice Exercises, 251-253

Problem solving
mini-problems in, 90, 104, 154, 171, 222 • money in, 127, 130, 148, 250 • word problems in, 106, 111, 134, 147, 150-151, 167, 179
Problem solving skills
choosing an addition sentence to go with a problem, 35 • choosing a subtraction sentence to go with a problem, 36 • deciding whether to add or subtract in a problem, 40 • learning to read mini-problems, 81 • learning to read word problems, 106
Product, 246
Property(ies)
order property for addition, 29-30, 137, 139 • order property for multiplication, 233

Quarter, 129
Quarter litre, 203

Rectangle, 184
Relating addition and subtraction, 41, 89, 177-178

Sign(s), *See* Symbol(s)
Sphere, 188
Square, 185
Subtraction
checking, 153 • families, 38, 78-79, 146 • of ones from tens and ones, no regrouping, 100, 102-103, 126 • of ones from tens and ones, regrouping, 229-230 • of tens, no regrouping, 99-100, 126 • of tens and ones, no regrouping, 102-103, 218, 252 • of tens and ones, regrouping, 211, 219 • of hundreds, 164 • of hundreds, tens, ones, no regrouping, 165, 166 • regrouping in, 219-220, 223, 255 • related to addition, 89, 108, 145, 177 • facts to 7, 31-32, 37, 42-45 • facts to 8, 75 • facts to 9, 76-77, 82, 91, 251 • facts to 10, 107, 253 • facts to 12, 142 • facts to 14, 143-144 • facts to 16, 174, 177 • facts to 18, 175-177, 256 • zero in, 33-34

Symbol(s)
division, 245 • greater than, 15 • less than, 15 • times, 231
Symmetry, 193

Temperature, 204
Thermometer, 204
Time
by the half hour, 63-64 • by the hour, 64 • calendar, 73 • notation, 67 • to five-minute intervals, 66-67
Triangle, 183

Zero
as a factor, 235 • in addition, 27-28 • in subtraction, 33

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